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ABSTRACT

Graduating from a Less Selective University during a Recession: Evidence from Mobility Report Cards and Employer Recruiting*

Using mobility report card data, I show graduates of less selective universities experience more adverse impacts of graduating in a recession. I highlight one mechanism: during recessions employers stop recruiting at less selective universities. Using a unique dataset of employer recruiting strategies for 65 prestigious firms, I show they are more likely to stop recruiting at universities that are less selective, smaller, farther, and have less affluent students. Firms also resume recruiting less quickly at less selective and farther campuses. Finally, losing access to prestigious firms while on campus is associated with an additional 13% decline in the 2014 income success rate.

JEL Classification: I26, I23, J23, J31, E32

Keywords: Great Recession, recent college graduates, employer recruiting, university selectivity

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1 Introduction

Graduating from college in a recession has both immediate and persistent effects (Altonji, Kahn and Speer, 2016; Kahn, 2010; Oreopolous, von Wachter and Heisz, 2012; Liu, Salvanes and Sorensen, 2016).[1] While this fact has been well established, we still lack evidence showing which graduates are most affected and why. Specifically, there has been little work studying the relationship between university selectivity, and other university characteristics, and the recession's impact on graduates. Nor do we have much evidence on the mechanisms that might lead to heterogeneous impacts by university characteristics. This is important for a more complete understanding of the recession's impact on young workers, and with potential implications for students applying to college.

This paper highlights changes in the matching process during recessions that result in new workers matching with lower quality firms, and especially new labor market entrants from less selective universities. Evidence shows recessions' persistent effects are importantly explained by starting one's career at a lower quality employer (Oreopolous, von Wachter and Heisz, 2012).[2] This underscores the importance of understanding changes in matching at labor market entry.

I start by showing the Great Recession more adversely affected graduates from less selective universities, based on average incomes in 2014 using the mobility report card data (Chetty et al., 2020), roughly five years after graduation. To my knowledge, this is the first paper to establish this fact for U.S. students. There are a number of potential mechanisms, including differential worker search intensity, differential employer learning, and differences in occupations and industries by university selectivity.[3] I then focus on one mechanism:

[1] Forsythe (2020) shows high unemployment rates reduce the hiring rate of young workers, but not older workers.

[2] Oyer (2006) shows that starting one's career at a lower-ranked university, because of the business cycle, has persistent career effects for economists. Liu, Salvanes and Sorensen (2016) find the importance of match quality at one's first employer in Norway from 1986-2007, and Arellano-Bover (2020) shows the importance of starting at a larger firm, conditional on the business cycle.

[3] See Oreopolous, von Wachter and Heisz (2012) for a discussion of various mechanisms that could explain this fact.

employers were more likely to stop recruiting at less selective universities during the recession. I collect panel data on the university campuses that employers target for recruiting from 2000-2013, focusing on a sample of 65 prestigious finance, consulting, and Fortune 250 companies recruiting for business positions. Using these unique data, I show substantial declines in access to high-wage jobs for college students during the Great Recession, and I test for differential impacts by university characteristics, including selectivity.

Finally, I merge the recruiting data with the mobility report card data (Chetty et al., 2020) to analyze the impact on income success of losing access to prestigious firms on campus.

Given that campus recruiting is an important way in which college students find jobs, the campus is an important and natural dimension over which to analyze differential effects of recessions. In a recent survey of 275 firms across many industries, over 75% conducted on-campus interviews, and nearly 60% of full-time entry-level college hires were initially interviewed on campus (National Association of Colleges and Employers 2014). Despite the relevance of the university for access to firms, there has been very little work focusing on whether graduates of certain universities are more resilient to shocks.[4]

There are several reasons why firms may stop recruiting from less selective universities during recessions. As suggested by the model in Weinstein (2018), recruiting in less selective applicant pools may require costly screening, and productivity losses during recessions may make this unprofitable. Recent work has suggested firms may adjust hires during recessions by decreasing vacancies, as well as recruiting intensity per vacancy (Davis, Faberman and Haltiwanger, 2013; Carillo-Tudela, Gartner and Kaas, 2021; Forsythe and Weinstein, 2021; Lochner et al., 2021; Hershbein and Kahn, 2018; Modestino, Shoag and Ballance, 2020). Dropping the least selective campuses is consistent with a decrease in recruiting intensity per vacancy as these universities may require more screening. Pausing recruiting at less selective universities during recessions is also consistent with the model in Acharya and Wee

[4]In an important paper, Oreopolous, von Wachter and Heisz (2012) study Canadian college graduates from 1976 to 1995, before the Great Recession, and find more adverse impacts for graduates of typically lower-earning universities.

(2020), in which firms become more selective during recessions as there are greater losses from hiring lower quality workers. Differential effects at less selective universities are also consistent with offer acceptance rates increasing at more selective universities, decreasing the need to additionally recruit at less selective universities, related to an upskilling story.

First, using a triple-difference specification, I find that graduates of less selective universities are more adversely affected by the Great Recession relative to same-state (or same-CZ) Barron's Tier 1 universities, excluding the Ivy Plus universities. I identify this effect, separately from persistent lifecycle differences across university selectivity tiers, by comparing universities in severely affected areas to universities in mildly affected areas. In severely versus mildly affected states, 2014 income is an additional 5% lower for the 1986 (recession birth cohort) relative to the 1984 (pre-recession) birth cohort at Barron's Tier 2 and Barron's Tier 3-5 universities relative to same-state non-Ivy Plus Barron's Tier 1 universities.

Next, I test one potential mechanism for the finding above: employers differentially stopped recruiting at less selective universities. Students at universities across a large range of selectivity, from "Ivy Plus" through Barron's Tier 3-5, lose access to prestigious firms during the Great Recession. However, these effects are largest in relative terms for universities outside the Ivy Plus tier. Second, when a firm no longer recruits in 2009 at one of its 2007 target campuses, it is more likely to have dropped its less selective targets, universities further from the firm's office, smaller universities, and universities where the students have less wealthy parents. Further, a firm is much more likely to have added back Ivy Plus and closer universities by 2011 after dropping them in 2009. By 2013, closer universities are still more likely to have been added back as target campuses.

Finally, I merge the recruiting data with the mobility report card data (Chetty et al., 2020), to analyze the impact of losing access to prestigious firms during the recession. This is a more suggestive exercise, as I cannot confirm changes in income success are due to fewer hires by these particular firms. However, the results are consistent with lost access at labor-market entry affecting longer-run outcomes. For universities which lost access to at least one

prestigious firm, the 1986 (recession) birth cohort is .7 percentage points less likely to have income in the top 1% for their birth cohort, relative to the 1984 (pre-recession) birth cohort, and relative to graduates from same-tier, same-CZ universities. This is a 13% decline, and implies roughly 13 fewer students reached the top 1%, a reasonable magnitude given the dropped campuses on average lost access to over two firms. Comparing to same-tier, same-state universities implies roughly 8 fewer students from these universities reached the top 1%.

The paper contributes to a growing literature studying the impact of graduating during a recession, described above. The central contribution of this paper is to focus on changes in the matching process that lead to immediate adverse impacts, and to highlight which types of universities experience the most adverse changes in this process. Second, merging recruiting data with the mobility report card data yields suggestive evidence that these changes in access have longer-run effects. Finally, this papers presents the first evidence to my knowledge of the impacts of the recession on new graduates by university selectivity.

Further, the paper contributes to our understanding of how employers adjust recruiting intensity during recessions. Starting with Davis, Faberman and Haltiwanger (2013), adjustments in recruiting intensity have been suggested as one reason for the breakdown in the standard matching function during the Great Recession. However, with the exceptions noted above, there has been limited micro-level evidence documenting the way in which employers adjust recruiting with the business cycle. Using the identity of employers' target campuses, I provide detailed evidence on how employers shift recruiting strategies with the business cycle. Specifically, I find employers are more likely to drop the least selective, smallest, and farthest campuses.[5] As discussed above, this is consistent with declines in recruiting intensity and effort.[6]

Finally, this paper contributes to our understanding of who has access to high-wage jobs

[5]Related, Weinstein (Forthcoming) shows firm-university distance has a causal impact on the likelihood of recruiting.

[6]Recruiting at smaller universities may require recruiting at more universities overall.

at the start of their career (Zimmerman (forthcoming), MacLeod et al. (2017), Weinstein (2018, Forthcoming)).

2 Effects of the Great Recession on Income, by University Selectivity

I start by showing that students at less selective universities were more adversely impacted by the Great Recession. As discussed above, there are various mechanisms that could explain this result, and the coming sections will test for the importance of one particular mechanism. I use the mobility report cards (Chetty et al., 2020), which contain data on 2014 earnings by university and birth cohort. Given the timing, these data do not allow us to establish how the recession's immediate effects differ by university selectivity. We observe the recession cohorts approximately five years after graduation; the literature on recessions' persistent effects makes this compelling. I estimate the following triple-differences model:

$$Y_{j_{ks}t} = \beta_{st} + \gamma_{kt} + \lambda_{kst} Cohort_t * Tier_{j_{ks}} * SevereRecession_{j_{ks}} + \kappa_j + X_{jt}\delta + u_{jt} \quad (1)$$

Observations are at the university-birth cohort level. The dependent variable is the natural log of average income in 2014, for graduates of university j, in selectivity tier k and location s, in birth cohort t. We include university fixed effects, and so we analyze within-university differences in graduates' 2014 income, across birth cohorts. We are interested in how the effect of the Great Recession varies across university selectivity tiers. As a result, we analyze whether the differences across cohorts differ by university selectivity tier, by including birth cohort-selectivity tier fixed effects γ_{kt}. Including local area by cohort fixed effects β_{st}, we compare these differences across university tier among universities in the same local area. We show results defining the local area as the state, as well as the commuting

zone.

We observe incomes of the recession cohorts at roughly 25-29 years old, and of the pre-recession cohorts in their early 30s. If there are differences across university tier in the timing of career trajectory and income growth, comparison of recession and pre-recession cohorts may be capturing these differences rather than recession effects.[7] To account for this I include a triple difference ($Cohort * Tier * Severe$), comparing differences across birth cohorts by university selectivity tier in areas that experienced severe recessions, to those that experienced milder recessions. This triple difference identifies the additional effect of the recession on across-tier differences, rather than differences across tiers that would exist even absent recessions. This strategy is similar to the strategy in Yagan (2019), in which he uses spatial variation in recession severity to identify the impact of the recession separately from secular nationwide shocks.

I define a severely affected state as one that experienced an above-median increase in the unemployment rate between 2007 and 2009. I define a severely affected CZ as one that experienced an above-median increase in the unemployment rate between 2007 and 2009, using data from Yagan (2019).[8].

University tiers k include Ivy Plus (12 universities), Barron's Tier 1 universities excluding the Ivy Plus group (65 universities), Barron's Tier 2 universities (99 universities), and Barron's Tier 3-5 universities (1003 universities). In estimating 1, the coefficients λ are estimated relative to non-Ivy Plus Tier 1 universities, and the omitted cohort is 1984. The 1984 birth cohort was 22 in 2006, and thus likely graduated just before the recession started. To facilitate interpretation, I include only universities in local areas that have at least one non-Ivy Plus Tier 1 university. For example, $\lambda_{1985,Tier2}$ is the average additional difference between Tier 2 and same-state non-Ivy Plus Tier 1 graduates, in the 1985 birth cohort

[7]Chetty et al. (2020) shows there are differences across university selectivity tier in how quickly income percentiles stabilize.

[8]Appendix Table A.3 shows the effects of graduating from a university in a severely affected state, relative to same-cohort, same university-selectivity tier, individuals. This is consistent with firms in the university's market affecting college students' job opportunities (Weinstein, Forthcoming), and college majors affected by shocks in the university's market (Weinstein, 2020)

relative to the 1984 birth cohort, in severely versus mildly affected states.

I show results including only universities with data for each cohort, and so the sample is completely balanced.[9] I exclude universities for which the income is reported for a system of universities, as the system may include universities of multiple tiers. I also include only universities through Barron's Tiers 3-5.

I include time-varying university characteristics in X from the mobility report card to address the possibility that timed with the recession, less selective universities in severely affected states experienced differential changes in student composition that were correlated with income in 2014. Specifically, I include various measures of parental incomes, ln(students in the cohort), and the fraction of the cohort that is female.[10] I cluster standard errors at the university level, and weight observations by the number of students in the birth cohort at the university.

Because the Ivy Plus tier has only 12 universities, I focus on the differences between the non-Ivy Plus Tier 1 universities and the Tier 2 and Tiers 3-5 universities.

Figure 1 shows that in severely versus mildly affected states, the income difference between the 1985 and 1984 birth cohort is significantly more negative for Tier 2 universities relative to non-Ivy Plus Tier 1 universities in the same state. This continues to be true through the 1990 birth cohort. We also see very similar results comparing Tier 3-5 universities to non-Ivy Plus Tier 1 universities. In severely versus mildly affected states, 2014 income is an additional 5% lower for the 1986 (recession birth cohort) relative to the 1984 (pre-recession) birth cohort at Tier 2 and Tier 3-5 universities relative to same-state non-Ivy

[9] Appendix Table A.1 shows results from a specification requiring only that universities have data for the 1984 cohort, allowing us to compare the effect for each cohort to the effect for the 1984 cohort using the same set of universities. This increases the universities contributing to identification slightly, but yields very similar results.

[10] Parental income measures include the fraction of the cohort that has parents in the first quintile of the income distribution, in the second quintile, in the third quintile, and in the fourth quintile, the fraction with parents in the top 10%, top 5%, top 1%, and top .1% of the income distribution. Appendix Table A.2 shows results from estimating equation (1) with the X characteristics as dependent variables. There is a long-run declining trend in the share of students from wealthier families, but this does not appear to explain the mobility results in Figure 1 given there is no pre-trend in those results. Further, we control for these variables in the mobility regression.

Plus Tier 1 universities. Reassuringly, we do not see evidence of pre-trends before the 1984 cohort. This mitigates concerns that these effects are not explained by the recession, but by persistent differences between areas that were severely and mildly affected by the recession.

Appendix Figure A.1 shows a similar pattern when we compare universities within the same commuting zone, though the results are less precise. Interestingly, Appendix Table A.1 shows there is no change in the R-squared when including CZ-cohort fixed effects instead of state-cohort fixed effects. This, along with the similar pattern of the coefficients, mitigates concerns that the results in Figure 1 are driven by less selective universities being located in more severely affected areas within states.

Together, these results show the Great Recession had more adverse impacts on students at less selective universities. For the remainder of the paper, I focus on showing one particular mechanism that could explain this result: employer recruiting decisions.

3 Employer Recruiting During the Great Recession

3.1 Employer Recruiting Data

I collect a unique panel dataset of recruiting strategies using The Internet Archive: Wayback Machine. I focus on the Fortune 250 firms (2010), and Vault's 50 most prestigious consulting and banking firms in 2007 and 2008, respectively.[11]

Using the data collection strategy identified in Weinstein (Forthcoming), for each firm, I identified whether the firm's website in the Fall of each year contained information on undergraduate target campuses, for 2000 through 2013. For Fortune 250 firms I focus on those firms which distinguish the division for which they are recruiting. I denote whether a firm (f) recruits at a given university (j) in a given year (t) ($Recruit_{fjt}$), for each university in Princeton Review's The Best 376 Colleges (2012).[12] For consistency, for the Fortune 250

[11]The 2007 ranking of banking firms contained very few firms.

[12]I exclude universities without IPEDS data and test scores, foreign universities, and service academies. I create one observation for the five Claremont Colleges.

firms, this is specifically whether they recruit for a business position.

Not all recruiting pages are archived. Either the automated web crawlers were not aware of the site's existence at the time of the crawl, or the site blocked access to automated web crawlers. I code *Recruit* as missing if the page is nonarchived. However, a nonarchived page may reflect that the page did not exist, and suggest no active recruiting that year.[13] By excluding these, I may underestimate the decline in recruiting during the Great Recession. For robustness, I set to zero the observations which were set to missing that may have reflected a lack of recruiting (reasons other than the page being blocked or nonworking links).

I merge these recruiting data with university-level characteristics from the mobility report cards in Chetty et al. (2020). These data are aggregated by birth year, not graduation year, and so I merge birth cohorts to recruiting on their campus in the Fall of the calendar year they turn 22. Students born in 1986 are merged to recruiting on their campus in Fall 2008, which is relevant for students graduating in Spring 2009.[14] For the recruiting analysis, this matters only for understanding which characteristics predict a campus being dropped. Most of these characteristics are unchanging over time, and the ones that do change such as cohort size and fraction female are not expected to change dramatically from year to year.

In addition to recruiting data, I collect panel data on firm office locations and calculate distance between the university and the firm's closest office in each year, as described in Weinstein (Forthcoming) and in the appendix.

3.2 Empirical Strategy

To estimate students' change in access to a firm during the Great Recession, I estimate the following regression:

[13] Appendix Figure A.3 shows the number of observations for which the recruiting page was not archived, for reasons other than being blocked or nonworking links, increases dramatically from 2007-2011. This suggests nonarchived pages may be related to the recession, and signify an absence of active recruiting.

[14] Students born in September through December of 1986, and who progress through schooling without delay, will generally be college seniors in Fall 2008.

$$Recruit_{fjt} = \alpha_{fj} + \gamma_t + \epsilon_{fjt} \quad (2)$$

Observations are at the firm-university-year level. The dependent variable is an indicator for whether firm f recruits at university j in year t. I include firm-university pair fixed effects, and analyze within-pair changes in recruiting over time. I cluster standard errors at the firm and university level.

To be included in the sample I require the firm-university pair had nonmissing recruiting data in 2007. This allows us to interpret the effect in each year as relative to 2007 for that pair. I also include only firms that recruit on at least one campus over the entire sample period, and only universities that attract at least one firm over the sample period. These are the firms and universities for which we would most expect changes during the recession. For comparison, I also show effects without this restriction (Appendix Table A.4). Appendix Table A.7 shows the firms in the sample and the years in which each firm is in the sample.

I next estimate equation (2) separately for each university selectivity tier: Ivy Plus, non-Ivy Plus Tier 1, Tier 2, and Tiers 3-5.[15]

Equation (2) identifies whether firms stop recruiting at universities during the Great Recession. I then analyze which types of campuses firms are dropping as recruiting targets. I identify all firm-university pairs for which the firm recruited at the university in 2007, and then I identify those for which the firm did not recruit at the university in 2009 ($Dropped_{fj}$). I choose these years as the within-pair likelihood of recruiting peaks in 2007 and has a trough in 2009, as we will see in Figure 2. I then estimate the following regression, with one observation for each firm-university pair for which $Recruit_{fj2007} = 1$:

[15]Some universities report as a system, and the tier is associated with the largest university in the system. In estimating equation (2), I include the 21 universities reporting as a system, given they are likely the largest in their system based on their inclusion in the Princeton Review's ranking of the best 362 universities. Results are also very similar when excluding these universities. There are two university systems that have more than one university in the dataset: University of Arizona and Arizona State University, and University of Maryland and University of Maryland Baltimore County. It appears that neither of the Arizona universities is in Tier 1-4; University of Maryland is in Tier 3 and UMBC is not in Tier 1-4.

$$(Dropped_{fj}|Recruit_{fj2007} = 1) = \alpha_f + X_{fj} + e_{fj} \tag{3}$$

I include firm fixed effects, and identify the average within-firm difference in the likelihood it drops one of its 2007 target campuses, associated with various university characteristics X. *Dropped* is missing if *Recruit* is missing in 2009. This implies $Dropped = 1$ only if we are certain the firm did not recruit in 2009.[16]

The characteristics X include university tier, an indicator for firm-university distance between 50 and 200 miles, and an indicator for firm-university distance more than 200 miles (firm-university distance less than 50 miles is the omitted group), log number of students in the cohort, whether the university is public, proportion of students with parents in the top income quintile, proportion of students with parents in the top 1% of the income distribution, and fraction of the cohort that is female. To facilitate comparison of magnitudes, I standardize the last three variables so they are mean zero and standard deviation one. The variables in X correspond to the cohort that turns 22 in 2007.

In the mobility report card data, for universities reporting as a system, these X variables (except for tier) are aggregated across all universities in the system. For this reason, in estimating (3) I include only universities that do not report as part of a university system.

Finally, I investigate whether there are systematic differences in which types of campuses experience the firm resume recruiting after leaving in 2009, I estimate a similar specification:

$$(Return_{fj}|Dropped_{fj} = 1) = \alpha_f + X_{fj} + e_{fj} \tag{4}$$

The regression sample includes firm-university pairs for which the firm dropped the university as a target campus in 2009 ($Dropped_{fj} = 1$). The dependent variable is an indicator for whether the firm had started to recruit again at the university in either 2010 or 2011. The variable *Return* equals zero as long as *Recruit* is not equal to one in either 2010 or

[16] As an alternative, I estimate the regression with $Dropped = 1$ if *Recruit* in 2009 is missing, which may reflect a lack of recruiting.

2011.[17]

Because the sample size falls dramatically when including only firm-university pairs for which $Dropped_{fj} = 1$, I include a smaller set of covariates in X relative to equation (3). Specifically, I include an indicator for whether the university is in the Ivy Plus tier, indicators for whether the firm-university distance is between 50-200 miles, and whether it is greater than 200 miles, and the natural log of the cohort size. As we will see, these were the most significant predictors of being dropped as a target campus in equation (3).

To understand if initial differences in re-gaining access are persisent, I estimate a separate specification where the dependent variable is an indicator for whether the firm had started to recruit again at the university in 2010, 2011, 2012, or 2013.

3.3 Results

Figure 2 and Table A.4 show the results from estimating equation (2). On average, there is a statistically significant 1.4 percentage point decline in the likelihood that students have access to a given firm in 2008 relative to 2007. In 2009, this decline is over 2 percentage points, statistically significant at the 1% level.[18] The magnitude of the decline then lessens, but remains at around 1 percentage point, statistically significant at the 5% level. We cannot interpret these as dynamic effects, because the sample is not balanced. To understand whether the decline is truly lessening over time, I estimate an alternative specification requiring that firm-university pairs have data in 2007, 2009, and 2013. There is a 2 percentage point decline in 2009 relative to 2007, significant at the 1% level (Figure A.2, Appendix Table A.4). In 2013, the decline is .9 percentage points relative to 2007, but not significant from zero. We can rule out that the effect in 2009 is equal to the effect in 2013 at the 10%

[17]For robustness, I estimate the specification with *Return* equal zero only if we know for certain the firm did not recruit in 2010 or 2011. This alternative specification drops observations with *Recruit* equal to missing in 2010 and 2011, which may have an important effect on precision given the already smaller sample size.

[18]Appendix Table A.4 column 7 shows the results without restricting to universities that experience at least one recruiting firm over the sample, and firms that recruit on at least one campus over the sample. Magnitudes are smaller in levels, but similar in percentage terms given the smaller mean of the dependent variable in 2007 (.03).

level. Thus, there is some evidence that by 2013 access may still be reduced, but not by as much as in 2009.

We see similar declines in access, though slightly larger in percentage terms, when setting *Recruit* to zero instead of missing when the missing value may reflect lack of recruiting (reasons other than than being blocked or nonworking links, Appendix Table A.5).

Figure 3 and Table A.4 show the results estimating equation (2) separately by university selectivity tier. We see statistically significant declines in access in 2009 for each tier of university selectivity: Ivy Plus through Barron's Tier 3-5 universities. In relative terms these effects are largest for universities outside the Ivy Plus tier. The 7.7 percentage point decline at Ivy Plus universities is a 31% decline relative to 2007. There is a 39% decline at Tier 1 universities excluding the Ivy Plus group, at Barron's Tier 2 (highly selective) there is a 42% decline, and at Barron's Tiers 3-5 (selective) there is a 45% decline. The effects are smaller in magnitude by 2013, but still below zero with some significant at least at the 10% level.

These results show that while all students lose access to these firms, effects are largest in relative terms for students at less selective universities.

3.3.1 What Types of Universities Lose Access?

To more directly test which types of campuses firms are dropping as recruiting targets, we look within firms and ask which types of campuses they are most likely to drop, among their 2007 targets (equation (3)). Among a firm's target campuses in 2007, relative to one of its Ivy Plus targets it is 14 percentage points more likely to drop a non-Ivy Plus university in Barron's Tier 1 ($p \leq .05$), and 27-29 percentage points more likely to drop a highly selective or selective university ($p \leq .01$) (Figure 4 and Table A.6). We can rule out that the effects are the same for non-Ivy Plus Tier 1 and Tier 2 universities, and we can rule out the effects are the same for non-Ivy Plus Tier 1, Tier 2, and Tiers 3-5 with $p = .11$.

Firm-university distance is also a significant predictor of which campuses firms drop as

recruiting targets during the recession. Among a firm's target campuses in 2007, firms are 12 percentage points more likely to drop campuses that are 50 to 200 miles away, relative to those within 50 miles, significant at the 1% level. Universities more than 200 miles away are not significantly more likely dropped. This may reflect that there are significant benefits from recruiting at these universities, given that the costs are arguably quite high due to the distance. In other words, these universities may have been less likely to be at the margin of being recruiting targets, relative to those 50-200 miles away.

Conditional on university selectivity and distance, firms are 8.6 percentage points less likely to drop a campus if the fraction of students with parents in the top income quintile is higher by one standard deviation. There is no additional effect for universities where a higher fraction of students have parents in the top 1%. Among a firm's target campuses in 2007, they are 1.2 percentage points less likely to drop a campus if the cohort is larger by 10%. There are large differences in size among target campuses in 2007, with the 25th percentile at 1089 students and the 75th percentile at 3969 students. The coefficient on ln(students in cohort) implies that all else equal, firms are roughly 16 percentage points more likely to drop the university at the 25th percentile relative to the 75th percentile. Figure A.4 and Table A.6 show similar results when defining dropped campuses as those with zero or missing recruiting in 2009.

These results show that students at less selective, smaller and farther universities are more likely to lose access, as are students at universities with less affluent students.

3.3.2 What Types of Universities Re-Gain Access More Quickly?

Estimating equation (4), among the target campuses a firm dropped in 2009, it is 11 percentage points more likely to have returned to Ivy Plus campuses in 2010 or 2011, relative to less selective universities (Figure 5 and Table A.6). The firm is also 15 percentage points less likely to have returned to campuses that were more than 200 miles away.

By 2013, there are no significant differences in likelihood of returning by university se-

lectivity, though firms are still 14 percentage points less likely to have returned to campuses more than 200 miles away, significant at the 10% level.

These results show that students at less selective and farther universities lose access for a longer period of time. Figure A.5 and Table A.6 shows very similar magnitudes for the effect of being an Ivy Plus university and being more than 200 miles away when setting *Return* to missing if *Recruit* is missing. However, the coefficient on Ivy Plus is less precisely estimated ($p = .1$), unsurprising given the drop in the sample size.[19]

4 The Effect of Losing Access to Prestigious Firms on Income Success

Students who graduate during the recession lose on-campus access to prestigious firms, and this is most pronounced for students at less selective universities. In this section, I analyze the impact of losing access to firms on the likelihood of earning in the top 1% in 2014.

The firms in the sample are precisely the firms that might enable earnings in the top 1%. Given that we study incomes in 2014, finding an effect presents further evidence that the recession's effects are persistent.

This analysis is more suggestive for a few reasons. First, the data do not allow me to confirm that additional students in the top 1% from pre-recession cohorts were hired by firms that stopped recruiting during the recession. Finding an effect would be consistent with losing access to these prestigious firms. Second, if the university lost access to the firms in my sample, it is possible that it was also more likely to lose access to many other firms during the recession. In this case, I will estimate the differential effect of graduating from a university that lost access to more firms during the recession, relative to another same-tier,

[19]The number of firms in these regressions falls to 22 and 23, and for the coefficient on Ivy Plus, when looking at returning by 2011, the two-way clustered standard errors are smaller than the standard errors clustered at the university level. In these plots, we show confidence intervals for which the standard errors are clustered at the university level.

same-area university. Third, we are analyzing incomes roughly five years after the recession cohorts graduate from college, and there are other factors that could affect their outcomes over that period. However, the literature establishing persistent effects of recessions makes this analysis more compelling.

I merge the recruiting dataset to the mobility report cards, and analyze the effect of universities losing access to at least one firm between 2007 and 2009. I estimate the following regression:

$$Y_{j_{ks}qt} = \beta_t LostAccess + \gamma_{kst} + \kappa_j + X_{jt}\delta + u_{j_{ks}qt} \tag{5}$$

Observations are at the university-birth cohort-parental income quintile level, and thus there are five observations for each university-birth cohort combination. The dependent variable is the fraction of students in the top 1% of income for their birth cohort, among students in birth cohort t, and parental income quintile q at university j in tier k and location s. We include university fixed effects, and analyze the within-university difference in income success across birth cohorts, and the differential effect for universities that lost access to at least one prestigious finance, consulting, or Fortune 250 company between 2007 and 2009. Including university selectivity tier by location by cohort fixed effects (γ_{kst}), we compare this difference to the difference for other same-tier, same-location universities. I use CZ as the main measure of location, but also show results using state as the measure of location.

I balance the sample on university-cohort, so each cohort in the regression has data for the same set of universities. Appendix Table A.8 shows results requiring only that the university has data for the 1984 cohort, which leads to a slight increase in the universities contributing to identification, but yields very similar results. I do not include universities for which income is reported for the university system as a whole, and I include only universities through Barron's Tier 3-5.

I include time-varying university characteristics in X to address the possibility that timed with the recession, universities that were dropped as target campuses may have differentially

changed in ways that were correlated with the income success of its graduates. I include the same variables I include in equation (1).[20] I weight observations by the number of students in the university-birth cohort-parental income quintile cell.[21] I cluster standard errors at the university level.

Figure 6 shows there is a differential decline in income success rates at universities losing access to prestigious firms for the 1985 and 1986 birth cohorts, relative to the 1984 birth cohort. These cohorts are likely on campus in years when the firm had stopped recruiting. The 1985 birth cohort also may have been on campus when the firm recruited, but they also may have been adversely impacted as very recent hires. These effects are relative to income success rates for graduates in the 1984 birth cohort from the same university. They are also relative to the change in income success rates for same-selectivity tier, same-CZ universities. For universities losing access to prestigious firms, there is an additional .70 percentage point decline in income success for the 1986 birth cohort relative to the 1984 birth cohort, relative to same-tier same-CZ universities. The mean income success rate for the 1984 birth cohort is .0543, among universities that lost access to prestigious firms and were in a CZ with a same-tier university that did not lose access. Thus, the coefficient of .70 implies a 12.9% decline in the income success rates for these graduates. Identification of this effect is based on 37 universities that lost access to prestigious firms, and were in a CZ with same-tier universities that did not lose access.[22]

[20]For robustness, I also include the fraction of students with SAT math scores above 700 or ACT math scores above 30. This is not available in the mobility report cards, but is constructed using IPEDS data. To minimize the assumptions made between birth cohort and the relevant year of test score data, I do not include this variable in the principal results, but including it in equation (5) yields nearly indistinguishable results.

[21]We additionally test for differential changes in X variables for dropped target campuses, estimating equation (5) with the X as dependent variables. Appendix Table A.9 shows some evidence that there were differential decreases in the share of students with parents in the top income quintile, though this is a long-run trend that continues through the 1991 birth cohort. As a result, it does not appear that this compositional change explains the differential effects on mobility, given that these mobility effects appear for the 1985 and 1986 cohort, but then reverse and are increasing in magnitude from 1988 through 1991. There is also some evidence of increases in the share of students with parents in the top 1%, and decreases in the number of students, which are also both long-run trends continuing through the 1991 cohort, and so do not appear to explain the mobility results.

[22]The effect of losing access to firms recruiting on campus may differentially hurt lower-income students if this is their principal means of accessing these firms. I test for differential effects by parental income quintile.

The .70 percentage point decline implies approximately 13.25 fewer students reach the top 1% of income for their birth cohort, for universities with parental income quintile cells equal to the median among those losing access and being located in the same CZ as a same-tier university that does not lose access. Among these universities, they on average lose access to 2.2 firms between 2007 and 2009. Thus, this magnitude implies each of the firms that had been recruiting used to hire approximately roughly six students from the university, which is roughly similar to the approximation in Weinstein (Forthcoming).[23] As discussed above, losing access to the firms in my sample may be correlated with losing access to other firms as well, which would reduce the number of implied hires per firm. The effect also implies losing access at labor market entry has persistent effects as income measurement in 2014 comes over five years after labor market entry.

Appendix Figure A.6 and Appendix Table A.8 show the results including state-university tier-birth cohort fixed effects, rather than CZ-university tier-birth cohort fixed effects. This identification is based on 61 universities that lose access to these prestigious firms, and are in the same state as a same-tier university that did not lose access. The results imply that for the 1986 birth cohort at universities losing access to prestigious firms, there is a 6.6% decline in income success rates relative to the 1984 cohort, and relative to the difference at same-selectivity tier, same-state universities that did not lose access. This implies 8.2 fewer students reach the top 1% of income for their birth cohort.[24] This implies each firm that had been recruiting at the university hired approximately 3.5 students.

If we had data on recruiting for all firms, we could then see the extent to which a greater likelihood of being dropped as a target campus explains the overall differential effect of the Great Recession for less selective university graduates. Because we only observe recruiting for

While the magnitude is only statistically significant for students from the top parental income quintile, the confidence intervals for the lower quintiles are very large and we cannot rule out they are the same for the 1986 cohort.

[23]Weinstein (Forthcoming) presents analysis showing a similar set of firms hired approximately three bachelor's degree students from the University of Michigan Ross School of Business in 2007, which did not include hires from the University of Michigan outside the business school.

[24]This is based on universities with parental income quintile cells equal to the median among those losing access and being located in the same state as a same-tier university that does not lose access.

a sample of firms, this calculation is more challenging. In fact, unconditionally, more selective universities are more likely dropped as they are also more likely to be target campuses for the set of firms in the sample. However, to the extent that there are many more firms, besides those in the sample, that recruit from less selective universities, the results suggest this may be an important mechanism.[25]

5 Conclusion

Students who graduate during recessions experience persistent adverse impacts in the labor market. There is a lack of evidence showing which graduates experience the most negative effects, nor is there evidence highlighting mechanisms for heterogenous impacts.

This paper contributes by showing students at less selective universities are more adversely affected by the Great Recession using mobility report card data (Chetty et al., 2020). The focus of the paper is to highlight one potential mechanism: changes in the matching process at labor market entry that lead new entrants to match with lower quality firms, especially pronounced for graduates from less selective universities. Using data on employer recruiting decisions for 65 prestigious finance, consulting, and Fortune 250 companies from 2000-2013, I show firms are especially likely to stop recruiting at the less selective campuses among their target universities. I also show firms are more likely to stop recruiting at smaller universities, farther universities, and universities where the students' families are less wealthy. Finally, merging the recruiting data to the mobility report cards, I present suggestive evidence that losing access to a prestigious firm results in an additional 13% decline in the likelihood of income in the top 1% for the birth cohort.

These results suggest some universities may enable more resilience to negative shocks, as

[25]We have limited power to detect differences in the effect of losing access by selectivity tier, especially when including CZ-cohort fixed effects. We estimate the regression with state-cohort fixed effects, allowing for differences in the effect of losing access by tier. For the 1986 cohort, there are statistically significant effects only for the non-Ivy Plus Tier 1 universities, and the effects are statistically less negative for Tier 2 and Tiers 3-5 universities. We can rule out the effects are the same for non-Ivy Plus Tier 1, Tier 2, and Tiers 3-5 universities at the 10% level. There is no variation in losing access among Ivy Plus universities, and so we do not estimate an effect for that tier.

they are less likely to lose recruiting firms. This information may be especially useful for high school students who are considering where to attend college, and to the people who advise them.

References

Acharya, Sushant, and Shu Lin Wee. 2020. "Rational Inattention in Hiring Decisions." *American Economic Journal: Macroeconomics*, 12(1).

Altonji, Joseph G., Lisa B. Kahn, and Jamin D. Speer. 2016. "Cashier or Consultant? Entry Labor Market Conditions, Field of Study, and Career Success." *Journal of Labor Economics*, 34(S1).

Arellano-Bover, Jaime. 2020. "Career Consequences of Firm Heterogeneity for Young Workers: First Job and Firm Size." *Working Paper*.

Carillo-Tudela, Carlos, Hermann Gartner, and Leo Kaas. 2021. "Recruitment Policies, Job Filling Rates and Matching Efficiency." *Working Paper*.

Chetty, Raj, John N. Friedman, Emmanuel Saez, Nicholas Turner, and Danny Yagan. 2020. "Income Segregation and Intergenerational Mobility Across Colleges in the United States." *Quarterly Journal of Economics*, 135(3).

Davis, Steven J., R. Jason Faberman, and John C. Haltiwanger. 2013. "The Establishment-Level Behavior of Vacancies and Hiring." *Quarterly Journal of Economics*, 128(2).

Forsythe, Eliza. 2020. "Why Don't Firms Hire Young Workers During Recessions?" *Working Paper*.

Forsythe, Eliza, and Russell Weinstein. 2021. "Recruiting Intensity, Hires, and Vacancies: Evidence from Firm-Level Data." *IZA Discussion Paper*, No. 14138.

Hershbein, Brad, and Lisa B. Kahn. 2018. "Do Recessions Accelerate Routine Biased Technological Change? Evidence from Vacancy Postings." *American Economic Review*, 108(7).

Kahn, Lisa B. 2010. "The Long-Term Labor Market Consequences of Graduating from College in a Bad Economy." *Labour Economics*, 17(2).

Liu, Kai, Kjell G. Salvanes, and Erik O. Sorensen. 2016. "Good Skills in Bad Times: Cyclical Skill Mismatch and the Long-Term Effects of Graduating in a Recession." *European Economic Review*, 84.

Lochner, Benjamin, Christian Merkl, Heiko Stüber, and Nicole Gürtzgen. 2021. "Recruiting intensity and hiring practices: Cross-sectional and time-series evidence." *Labour Economics*, 68.

Modestino, Alicia Sasser, Daniel Shoag, and Joshua Ballance. 2020. "Upskilling: Do Employers Demand Greater Skill When Workers are Plentiful?" *Review of Economics and Statistics*, 102(4).

Oreopolous, Philip, Till von Wachter, and Andrew Heisz. 2012. "The Short- and Long-Term Career Effects of Graduating in a Recession." *American Economic Journal: Applied Economics*, 4(1).

Oyer, Paul. 2006. "Initial Labor Market Conditions and Long-Term Outcomes for Economists." *Journal of Economic Perspectives*, 20(3).

Weinstein, Russell. 2018. "Employer Screening Costs, Recruiting Strategies, and Labor Market Outcomes: An Equilibrium Analysis of On-Campus Recruiting." *Labour Economics*, 55.

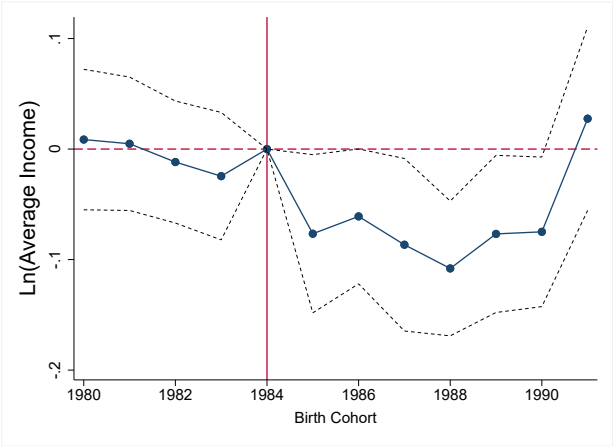
Weinstein, Russell. 2020. "Local labor markets and human capital investments." *Journal of Human Resources*.

Weinstein, Russell. Forthcoming. "Firm Decisions and Variation Across Universities in Access to High-Wage Jobs: Evidence from Employer Recruiting." *Journal of Labor Economics*.

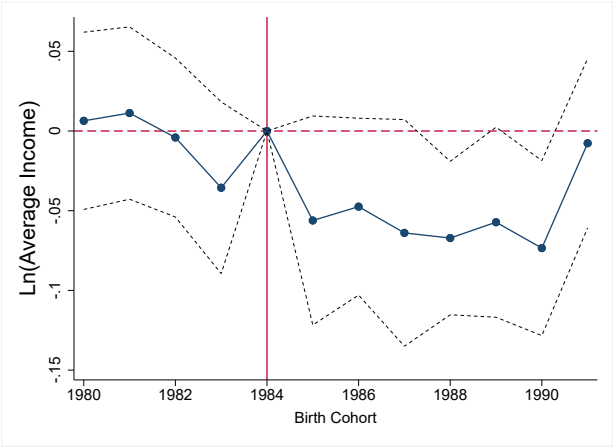
Yagan, Danny. 2019. "Employment Hysteresis from the Great Recession." *Journal of Political Economy*, 127(5).

Figure 1: **Effect of Recessions by University Selectivity, Relative to non-Ivy Plus Tier 1 Universities: Triple Difference Estimates with State-Cohort Fixed Effects**

(a) Tier 2 Universities



(b) Tier 3-5 Universities

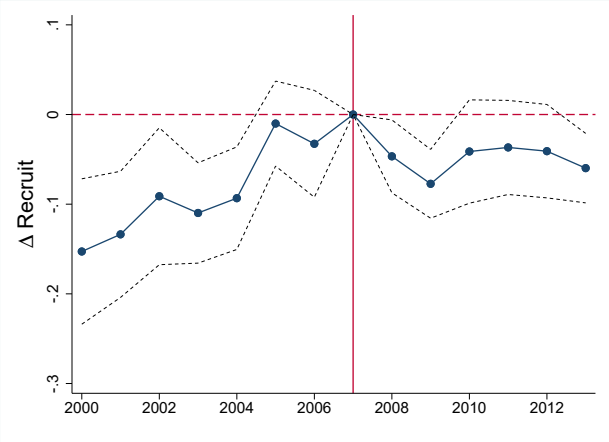


Notes: Plots are from the same regression, and show coefficients on the interaction between birth cohort fixed effects, university tier, and an indicator for the state experiencing a severe recession from 2007 to 2009. The regression includes lower-level terms, state-birth cohort fixed effects, university fixed effects, and the following covariates: the fraction of the cohort that has parents in the first quintile of the income distribution, in the second quintile, in the third quintile, and in the fourth quintile, the fraction with parents in the top 10%, top 5%, top 1%, and top .1% of the income distribution, ln(students in the cohort), and the fraction of the cohort that is female. Severe recession in this regression is an indicator for the state experiencing an above-median increase in the unemployment rate from 2007 to 2009. All effects are relative to non-Ivy Plus Tier 1 universities, and the regression includes only states that have a non-Ivy Plus Tier 1 university. Dashed lines show 95% confidence intervals. Standard errors are clustered at the university level. Observations are weighted by the number of students in the birth cohort at the university. All regressions include only universities that have data for each cohort. See text for details.

Figure 2: **Changes in Recruiting Over Time, within Firm-University Pairs**

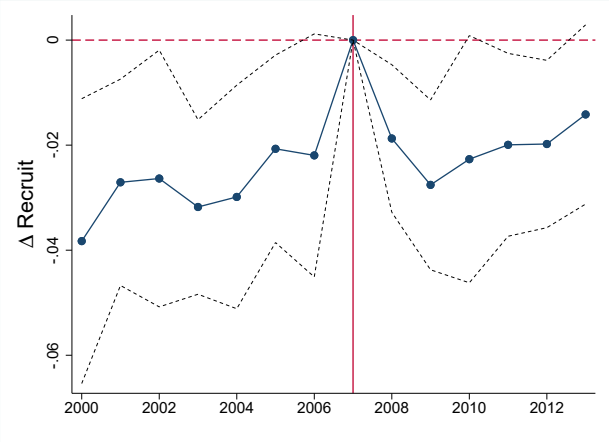
Notes: Dependent variable is an indicator for whether firm f recruits at university j in year t. Plot shows coefficients on year indicator variables, from a regression with firm-university pair fixed effects. Dashed lines show 95% confidence intervals, and standard errors are clustered at the firm and university level. The regression includes only firm-university pairs with data in 2007, and only firms that recruit on at least one campus in the data throughout the sample period, and universities that attract at least one firm in the data throughout the sample period. See text for details.

Figure 3: **Changes in Recruiting Over Time, within Firm-University Pairs, by University Selectivity**



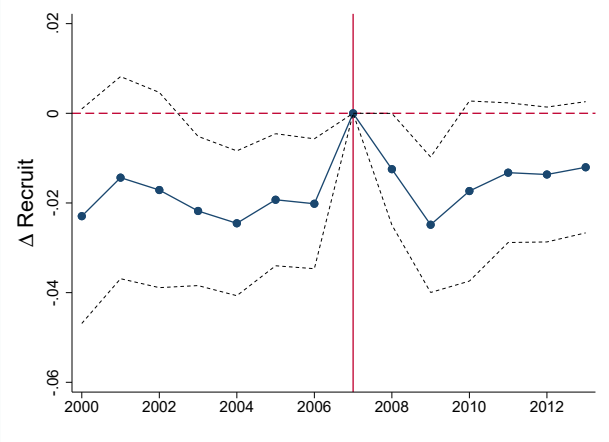
(a) 12 Ivy Plus Universities

Mean $Recruit_{2007} = .245$



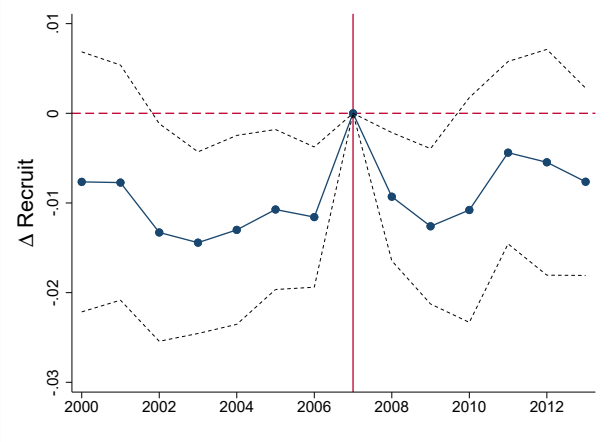
(b) 58 Tier 1 Universities (Excl. Ivy Plus)

Mean $Recruit_{2007} = .072$



(c) 58 Tier 2 Universities (Highly Selective)

Mean $Recruit_{2007} = .059$

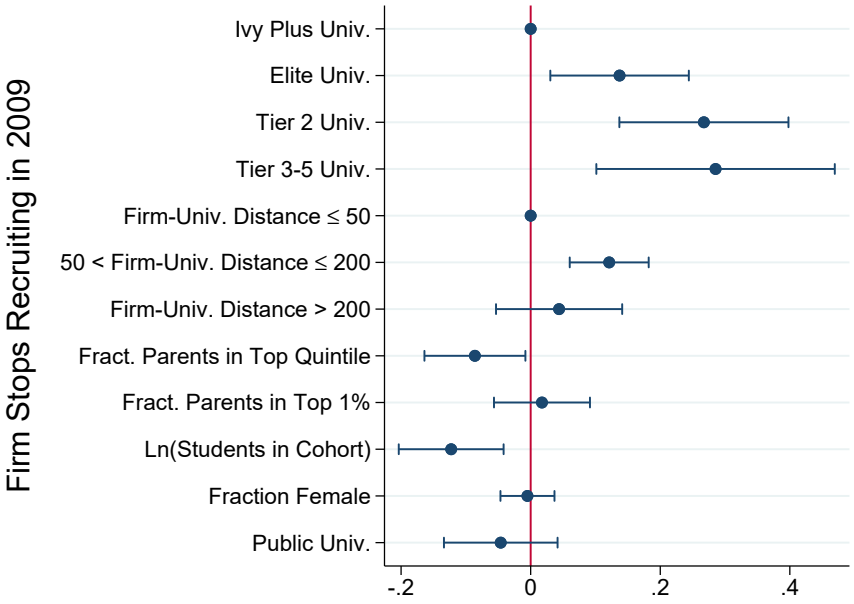


(d) 106 Tier 3-5 Universities (Selective)

Mean $Recruit_{2007} = .029$

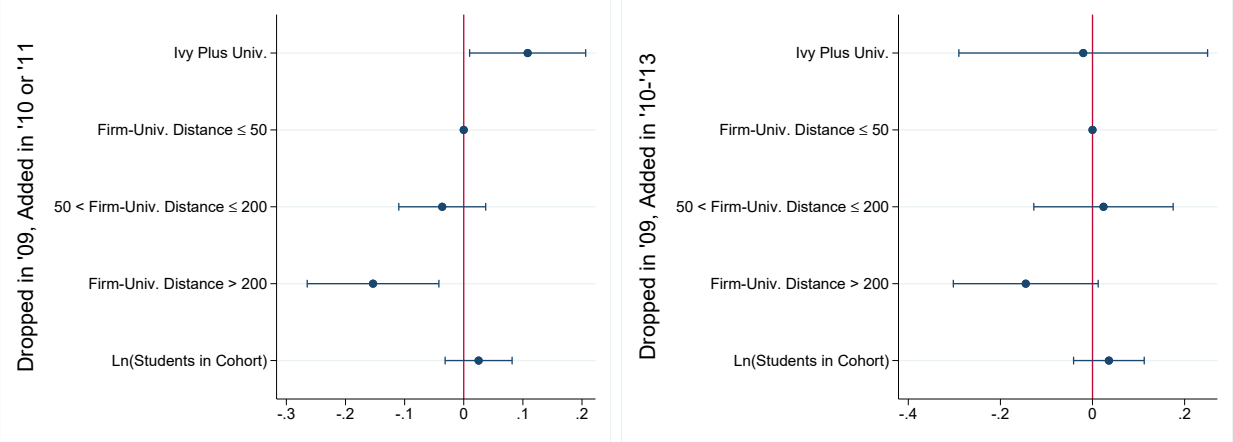
Notes: Dashed lines show 95% confidence intervals. Plots show regressions similar to those described in Figure 2, but with a separate regression for each tier of university selectivity. In Panel (a) standard errors are clustered at the firm level because there are only 12 universities, whereas in the other panels standard errors are clustered at the firm and university level. See text and Figure 2 for details.

Figure 4: **Dropped Target Campuses in 2009, by University Characteristics**



Notes: Plot shows coefficients on university characteristics when these characteristics are included as covariates together in the same regression. The dependent variable is an indicator for whether the firm was not recruiting on campus in 2009, but had recruited in 2007. The sample includes all firm-university pairs for which $Recruit = 1$ in 2007. The regression includes firm fixed effects. The coefficients on university tier are relative to Ivy Plus universities. Coefficients on firm-university distance are relative to distance less than or equal to 50 miles. The following variables are standardized so they are mean zero and standard deviation one in the regression sample: fraction with parents in the top income quintile, fraction with parents in the top 1% of the income distribution, and fraction of the university cohort that is female. Standard errors are clustered at the firm and university level, and ranges in the plot show 95% confidence intervals. We exclude universities for which the reporting of mobility report card variables is for multiple universities in a university system. We use covariate values corresponding to the 2007 cohort. See text for details.

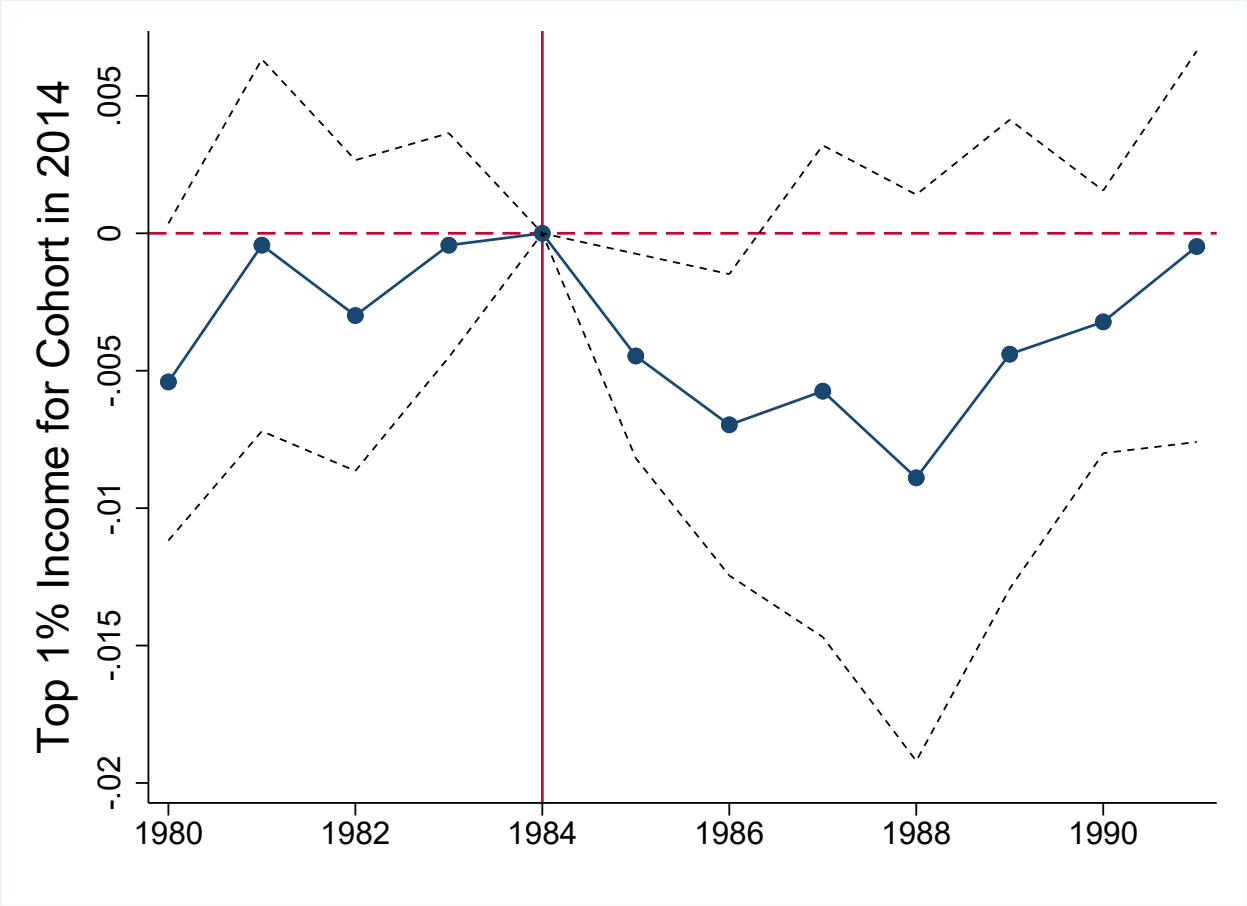
Figure 5: **Campuses Added Back After Being Dropped in 2009**



(a) Added Back 2010 or 2011 (b) Added Back 2010-2013

Notes: Plot shows coefficients on university characteristics, when these characteristics are included as covariates together in the same regression. The dependent variable is an indicator for whether the firm was recruiting on campus in 2010 or 2011 (5a), or 2010 or 2011 or 2012 or 2013 (5b), after not recruiting on campus in 2009, but recruiting in 2007. The sample includes all firm-university pairs for which $Recruit = 1$ in 2007 and $Recruit = 0$ in 2009. The regression includes firm fixed effects. Coefficients on Ivy Plus universities are relative to other university tiers. Coefficients on firm-university distance are relative to distance less than or equal to 50 miles. We use covariate values corresponding to the 2007 cohort. Standard errors are clustered at the firm and university level, and ranges in the plot show 95% confidence intervals. We exclude universities for which the reporting of mobility report card variables is for multiple universities in a university system. See text for details.

Figure 6: **Effect of Losing Access to Prestigious Firms During the Recession: Within CZ-University Tier-Cohort Estimates**



Notes: Dashed lines show 95% confidence intervals. Standard errors are clustered at the university level. Dependent variable is the fraction of students in the birth cohort, parental income quintile cell at the university who earn in the top 1% of the income distribution for their birth cohort in 2014. Observations are weighted by the number of students in the birth cohort, parental income quintile cell at the university. Plots show coefficients on the interaction between birth cohort fixed effects and an indicator for the university losing access to at least one prestigious firm recruiting on campus between 2007 and 2009. The regression includes CZ-university tier-birth cohort fixed effects and university fixed effects. The regression also includes the same covariates as in Figure 1. The sample includes only universities with data for each cohort. See text for details.

A Appendix

I collect these locations for each firm in each year, similarly to the collection of recruiting strategies. I obtain the latitude and longitude of the office locations using the Census Gazetteer place and county subdivision files, merging on the city name and state. For cities that could not be merged, I manually obtained the latitude and longitude. I additionally obtain university latitude and longitude from IPEDS.

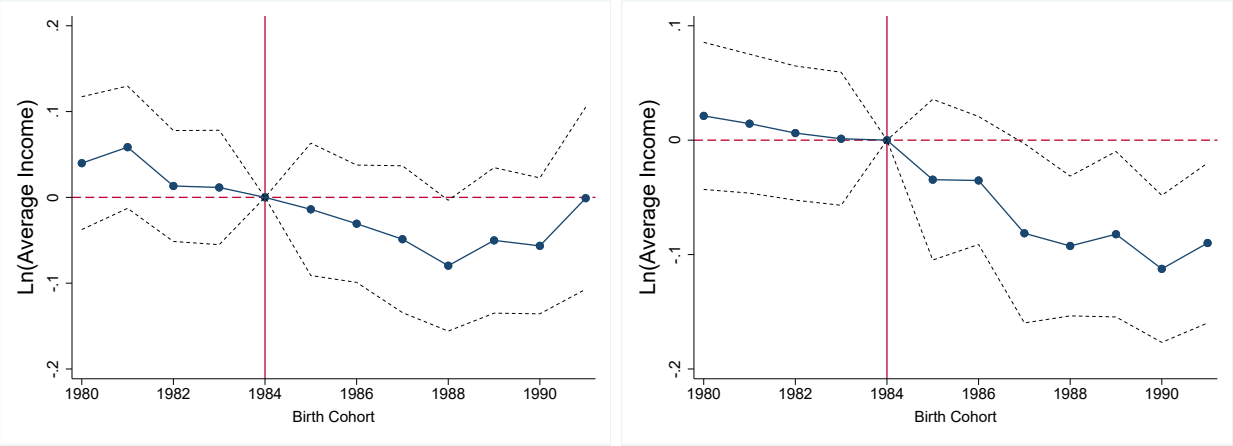
For each firm/university pair, in each year I calculate the distance between the university and every office location of the firm in that year.[26] In addition to some firms having unarchived or broken location pages, there is some variation within firms across years in the types of locations they report. I code location as missing for firm/years in which the reporting of locations seems inconsistent with other years.[27]

[26]Specifically, I compute the lengths of the great circle arcs connecting each university and each office location for a given firm, located on the surface of a sphere. The arc length, measured in degrees, is then converted to statute miles as measured along a great circle on a sphere with radius 6371 kilometers, the mean radius of the earth. These calculations are performed using the arclen and deg2sm commands in MATLAB.

[27]Details are available upon request.

Figure A.1: **Effect of Recessions by University Selectivity, Relative to non-Ivy Plus Tier 1 Universities: Triple Difference Estimates**

CZ-Cohort Fixed Effects



(a) Tier 2 Universities

(b) Tier 3-5 Universities

Notes: Dashed lines show 95% confidence intervals. Standard errors are clustered at the university level. Observations are weighted by the number of students in the birth cohort at the university. All regressions include only universities that have data for each cohort. Plots show coefficients on interaction between birth cohort fixed effects, university tier, and an indicator for the local area experiencing a severe recession from 2007 to 2009. All effects in the regressions are relative to non-Ivy Plus Tier 1 universities. Plots (A.1a) and (A.1b) present coefficients from the same regression, which includes CZ-birth cohort fixed effects and university fixed effects. The indicator for severe recession in this regression is one if the CZ experienced an above-median increase in the unemployment rate from 2007 to 2009. The regression includes only commuting zones that have a non-Ivy Plus Tier 1 university. See text for details.

Table A.1: **Effect of Recessions by University Selectivity, Relative to non-Ivy Plus Tier 1 Universities: Triple Difference Estimates**

Y = Ln(Average Income, 2014)				
1980*Highly Selective*Severe Shock	0.00859	0.0121	0.0399	0.0392
	(0.0324)	(0.0325)	(0.0394)	(0.0394)
1980*Selective*Severe Shock	0.00639	0.00484	0.0212	0.0196
	(0.0283)	(0.0283)	(0.0327)	(0.0322)
1981*Highly Selective*Severe Shock	0.00481	0.0113	0.0585	0.0586
	(0.0307)	(0.0308)	(0.0362)	(0.0362)
1981*Selective*Severe Shock	0.0113	0.00941	0.0144	0.0106
	(0.0275)	(0.0274)	(0.0309)	(0.0307)
1982*Highly Selective*Severe Shock	-0.0117	-0.0164	0.0133	0.00558
	(0.0281)	(0.0282)	(0.0329)	(0.0329)
1982*Selective*Severe Shock	-0.00408	-0.0104	0.00620	0.00524
	(0.0254)	(0.0249)	(0.0298)	(0.0281)
1983*Highly Selective*Severe Shock	-0.0245	-0.0149	0.0116	0.0133
	(0.0294)	(0.0283)	(0.0339)	(0.0325)
1983*Selective*Severe Shock	-0.0356	-0.0334	0.00123	-0.00551
	(0.0274)	(0.0262)	(0.0296)	(0.0273)
1985*Highly Selective*Severe Shock	-0.0766**	-0.0707**	-0.0140	-0.0154
	(0.0364)	(0.0354)	(0.0392)	(0.0372)
1985*Selective*Severe Shock	-0.0561*	-0.0588*	-0.0345	-0.0467
	(0.0334)	(0.0325)	(0.0357)	(0.0328)
1986*Highly Selective*Severe Shock	-0.0609*	-0.0616**	-0.0307	-0.0334
	(0.0311)	(0.0303)	(0.0348)	(0.0339)
1986*Selective*Severe Shock	-0.0474*	-0.0488*	-0.0352	-0.0437
	(0.0282)	(0.0276)	(0.0284)	(0.0275)
1987*Highly Selective*Severe Shock	-0.0866**	-0.0795**	-0.0487	-0.0592
	(0.0397)	(0.0385)	(0.0435)	(0.0410)
1987*Selective*Severe Shock	-0.0639*	-0.0629*	-0.0814**	-0.0936**
	(0.0362)	(0.0352)	(0.0398)	(0.0369)
1988*Highly Selective*Severe Shock	-0.108***	-0.101***	-0.0796**	-0.0860**
	(0.0311)	(0.0302)	(0.0388)	(0.0369)
1988*Selective*Severe Shock	-0.0672***	-0.0703***	-0.0925***	-0.0991***
	(0.0245)	(0.0239)	(0.0311)	(0.0290)
1989*Highly Selective*Severe Shock	-0.0768**	-0.0742**	-0.0501	-0.0500
	(0.0362)	(0.0348)	(0.0431)	(0.0409)

Table A.1 – continued from previous page

1989*Selective*Severe Shock	-0.0572*	-0.0612**	-0.0822**	-0.0856**
	(0.0303)	(0.0299)	(0.0368)	(0.0344)
1990*Highly Selective*Severe Shock	-0.0749**	-0.0698**	-0.0565	-0.0544
	(0.0345)	(0.0333)	(0.0403)	(0.0389)
1990*Selective*Severe Shock	-0.0734***	-0.0730***	-0.112***	-0.109***
	(0.0280)	(0.0278)	(0.0327)	(0.0311)
1991*Highly Selective*Severe Shock	0.0275	0.0219	-0.000960	-0.00381
	(0.0423)	(0.0399)	(0.0539)	(0.0516)
1991*Selective*Severe Shock	-0.00767	-0.0149	-0.0899**	-0.0890***
	(0.0270)	(0.0279)	(0.0355)	(0.0334)
Observations	7,680	9,327	4,212	4,972
R-squared	0.983	0.982	0.984	0.982
Balance	All	1984	All	1984
Non-Ivy Plus Tier 1 Univ. in Same Area as Tier 2, Severe Recession	29	30	19	19
Non-Ivy Plus Tier 1 Univ. in Same Area as Tier 2, Mild Recession	25	27	16	18
Non-Ivy Plus Tier 1 Univ. in Same Area as Tier 3-5, Severe Recession	32	34	34	36
Non-Ivy Plus Tier 1 Univ. in Same Area as Tier 3-5, Mild Recession	28	30	22	25
Tier 2 Univ., Severe Recession	34	42	16	21
Tier 2 Univ, Mild Recession	30	33	19	21
Tier 3-5 Univ, Severe Recession	324	428	153	194
Tier 3-5 Univ, Mild Recession	182	241	98	128
State-Cohort FE	Y	Y	N	N
CZ-Cohort FE	N	N	Y	Y

Notes: *** p-value $\leq$ .01, ** p-value $\leq$ .05, * p-value $\leq$ .1. Columns 1 and 3 show the coefficient estimates associated with Figure 1. Columns 2 and 4 show analogous figures requiring only that each university has data for the 1984 cohort. See Figure 1 and text for details.

Table A.2: **Differential Changes in Characteristics by University Selectivity, Relative to non-Ivy Plus Tier 1 Universities: Triple Difference Estimates**

	Share with Parents in Income Quintile					Share with Parent Income in Top				
	1	2	3	4	5	10%	5%	1%	Ln(Stud.)	Sh. Female
80*HS	-0.00332	-0.00691	-0.00498	-0.00406	0.0193	0.0198	0.0159	0.00382	0.000701	-0.00113
	(0.00627)	(0.00659)	(0.00656)	(0.00671)	(0.0170)	(0.0153)	(0.0123)	(0.00533)	(0.0516)	(0.00904)
80*S	-0.00761	-0.00390	-0.00398	-0.0103*	0.0258*	0.0193	0.0145	0.00389	-0.0251	0.000610
	(0.00489)	(0.00528)	(0.00585)	(0.00591)	(0.0140)	(0.0126)	(0.0102)	(0.00488)	(0.0301)	(0.00757)
81*HS	0.00425	-0.00706	-0.00502	-0.00673	0.0146	0.00769	-0.00121	-0.00211	-0.00553	0.00529
	(0.00480)	(0.00547)	(0.00552)	(0.00730)	(0.0137)	(0.0127)	(0.0108)	(0.00595)	(0.0360)	(0.00866)
81*S	-0.000656	-0.00696	-0.00400	-0.00661	0.0182	0.00638	-0.000395	-0.00346	0.0179	0.000502
	(0.00401)	(0.00449)	(0.00464)	(0.00672)	(0.0114)	(0.0102)	(0.00926)	(0.00544)	(0.0231)	(0.00747)
82*HS	-0.00148	-0.00128	-0.00402	-0.00129	0.00807	0.00281	0.00278	0.000858	-0.00599	0.00477
	(0.00395)	(0.00446)	(0.00534)	(0.00692)	(0.0117)	(0.0105)	(0.00859)	(0.00534)	(0.0299)	(0.00781)
82*S	-0.00158	0.00327	-0.00368	-0.00774	0.00973	0.00308	0.00555	9.15e-05	0.0190	-2.32e-06
	(0.00305)	(0.00382)	(0.00484)	(0.00613)	(0.0101)	(0.00911)	(0.00776)	(0.00484)	(0.0185)	(0.00636)
83*HS	-0.00176	-0.00123	-0.00657	-0.00799	0.0175**	0.00828	-0.000145	-0.00158	-0.000608	0.00504
	(0.00380)	(0.00424)	(0.00500)	(0.00680)	(0.00882)	(0.00768)	(0.00746)	(0.00417)	(0.0227)	(0.00758)
83*S	0.000215	-0.000214	-0.00575	-0.00797	0.0137**	0.00520	-0.000461	-0.000902	0.0222	-0.000565
	(0.00313)	(0.00343)	(0.00425)	(0.00598)	(0.00663)	(0.00577)	(0.00604)	(0.00392)	(0.0189)	(0.00651)
85*HS	0.000554	0.0114***	0.00659	0.00127	-0.0198**	-0.0126*	-0.0126**	0.00261	-0.00946	0.00729
	(0.00274)	(0.00386)	(0.00441)	(0.00604)	(0.00855)	(0.00762)	(0.00633)	(0.00454)	(0.0225)	(0.00774)
85*S	0.00126	0.00768**	0.0101**	-0.00803	-0.0110	-0.0129**	-0.0122**	0.00231	-0.0109	0.00375
	(0.00209)	(0.00343)	(0.00415)	(0.00549)	(0.00787)	(0.00647)	(0.00544)	(0.00417)	(0.0171)	(0.00651)
86*HS	-0.000229	0.0107**	0.00352	0.00185	-0.0159*	-0.0198***	-0.0101	-0.00302	-0.0280	0.00617
	(0.00383)	(0.00468)	(0.00437)	(0.00641)	(0.00937)	(0.00764)	(0.00787)	(0.00440)	(0.0241)	(0.00955)

Table A.2 – continued from previous page

	Share with Parents in Income Quintile					Share with Parent Income in Top				
	1	2	3	4	5	10%	5%	1%	Ln(Stud.)	Sh. Female
86*S	0.00168	0.00832**	8.97e-05	0.00254	-0.0126*	-0.0128**	-0.00749	-0.00169	-0.0182	0.00451
	(0.00288)	(0.00398)	(0.00373)	(0.00571)	(0.00727)	(0.00626)	(0.00671)	(0.00420)	(0.0187)	(0.00825)
87*HS	0.00331	0.0131***	0.00572	0.000638	-0.0228**	-0.0228**	-0.0127	-0.00564	-0.0306	0.00756
	(0.00365)	(0.00409)	(0.00515)	(0.00775)	(0.0111)	(0.0110)	(0.00921)	(0.00524)	(0.0289)	(0.00945)
87*S	0.00555**	0.00977***	0.00857**	-0.00452	-0.0194**	-0.0121	-0.00463	0.00139	-0.0157	0.00430
	(0.00260)	(0.00317)	(0.00418)	(0.00687)	(0.00831)	(0.00863)	(0.00737)	(0.00503)	(0.0207)	(0.00811)
88*HS	-0.00137	0.0203***	0.0144**	0.00377	-0.0371***	-0.0389***	-0.0271***	-0.00884*	-0.0388	0.000266
	(0.00432)	(0.00547)	(0.00617)	(0.00716)	(0.0138)	(0.0130)	(0.00964)	(0.00526)	(0.0334)	(0.0109)
88*S	0.00200	0.0122***	0.0146***	-0.00188	-0.0270***	-0.0270***	-0.0149**	-0.00390	-0.0301	0.00331
	(0.00298)	(0.00432)	(0.00502)	(0.00576)	(0.00987)	(0.00920)	(0.00665)	(0.00461)	(0.0249)	(0.00848)
89*HS	0.00546	0.0165***	0.0154**	0.00700	-0.0444***	-0.0415***	-0.0326**	-0.00429	-0.0477	0.000921
	(0.00503)	(0.00623)	(0.00613)	(0.00885)	(0.0163)	(0.0150)	(0.0129)	(0.00682)	(0.0350)	(0.0110)
89*S	0.00380	0.0107**	0.0149***	-0.000888	-0.0285**	-0.0255**	-0.0178*	-0.000147	-0.0388	0.00170
	(0.00360)	(0.00509)	(0.00434)	(0.00769)	(0.0118)	(0.0113)	(0.0105)	(0.00623)	(0.0254)	(0.00862)
90*HS	0.00655	0.0163**	0.0171**	0.00258	-0.0426**	-0.0425**	-0.0236	-0.000749	-0.0510	0.00749
	(0.00575)	(0.00687)	(0.00722)	(0.0103)	(0.0181)	(0.0166)	(0.0145)	(0.00707)	(0.0375)	(0.0120)
90*S	0.00655	0.0166***	0.0163***	-0.00338	-0.0361***	-0.0298**	-0.0109	0.00430	-0.0223	0.00768
	(0.00414)	(0.00559)	(0.00551)	(0.00885)	(0.0133)	(0.0116)	(0.0111)	(0.00655)	(0.0274)	(0.00869)
91*HS	0.00109	0.0181**	0.0170**	0.0137	-0.0500**	-0.0496**	-0.0281*	-0.00134	-0.0279	0.0152
	(0.00663)	(0.00778)	(0.00684)	(0.0116)	(0.0200)	(0.0196)	(0.0154)	(0.00717)	(0.0387)	(0.0116)
91*S	0.00746	0.0146**	0.0172***	-0.000434	-0.0388**	-0.0274*	-0.00923	0.00571	0.0139	0.0136
	(0.00521)	(0.00635)	(0.00519)	(0.0104)	(0.0151)	(0.0147)	(0.0123)	(0.00677)	(0.0284)	(0.00834)
Observations	7,680	7,680	7,680	7,680	7,680	7,680	7,680	7,680	7,680	7,680
R-squared	0.962	0.958	0.925	0.941	0.980	0.983	0.985	0.979	0.992	0.956

Table A.2 – continued from previous page

	Share with Parents in Income Quintile					Share with Parent Income in Top				
	1	2	3	4	5	10%	5%	1%	Ln(Stud.)	Sh. Female

Notes: *** p-value $\leq$ .01, ** p-value $\leq$ .05, * p-value $\leq$ .1. Coefficients are from estimating equation (1), with university characteristics as dependent variables. Coefficients represent the interaction between birth cohort, university selectivity tier (HS refers to highly selective and S refers to selective), and an indicator for severe shock. All columns include a balanced sample, state-birth cohort fixed effects, and university fixed effects. I also estimate the regression with the dependent variable equal to the share of students with parents in the top .1% of the income distribution, but omit the results here for space constraints. There were no statistically significant coefficients in that regression. See text and Figure 1 for details.

Table A.3: **Differential Effect of Recessions for Graduates in Severely Affected States**

Y = Ln(Average Income 2014)	
1980	0.0176***
	(0.00589)
1981	0.00952
	(0.00592)
1982	0.00196
	(0.00509)
1983	7.07e-05
	(0.00488)
1985	-0.00671
	(0.00549)
1986	-0.0135**
	(0.00624)
1987	-0.0172**
	(0.00722)
1988	-0.0288***
	(0.00757)
1989	-0.0348***
	(0.00842)
1990	-0.0359***
	(0.00937)
1991	-0.0199*
	(0.0120)
Observations	10,116
R-squared	0.978
University FE	Yes
Cohort-University Tier FE	Yes
Controls	Yes

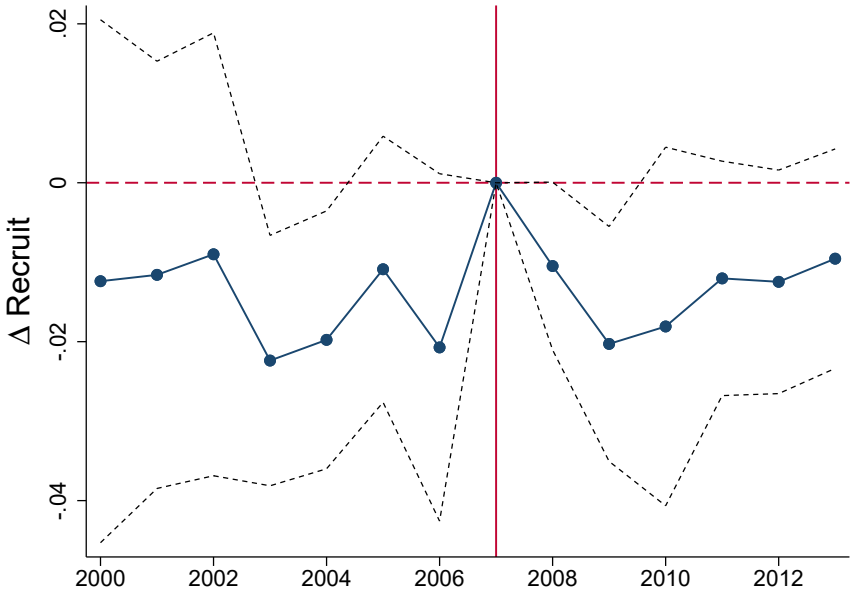
Notes: *** p-value $\leq$ .01, ** p-value $\leq$ .05, * p-value $\leq$ .1. Observations are at the university-birth cohort level, and coefficients are on the interaction between cohort fixed effects and an indicator for whether the university is in a severely affected state (above-median change in unemployment rate from 2007-2009.) The sample is balanced; the same universities are in the sample in each period. The regression includes the same covariates as in Figure 1. Observations are weighted by the number of students in the university-cohort cell. I exclude universities that report incomes for the university system. See text for details.

Table A.4: **Changes in Recruiting Over Time, within Firm-University Pairs**

Dependent Variable = Recruit	1	2	3	4	5	6	7
2000	-0.026***	-0.153***	-0.038***	-0.023*	-0.008	-0.012	-0.014***
	(0.009)	(0.041)	(0.014)	(0.012)	(0.007)	(0.016)	(0.005)
2001	-0.020***	-0.134***	-0.027***	-0.014	-0.008	-0.012	-0.010***
	(0.007)	(0.035)	(0.010)	(0.011)	(0.007)	(0.013)	(0.004)
2002	-0.021***	-0.091**	-0.026**	-0.017	-0.013**	-0.009	-0.011***
	(0.008)	(0.038)	(0.012)	(0.011)	(0.006)	(0.014)	(0.004)
2003	-0.025***	-0.110***	-0.032***	-0.022**	-0.014***	-0.022***	-0.013***
	(0.006)	(0.028)	(0.008)	(0.008)	(0.005)	(0.008)	(0.003)
2004	-0.024***	-0.093***	-0.030***	-0.025***	-0.013**	-0.020**	-0.012***
	(0.007)	(0.029)	(0.011)	(0.008)	(0.005)	(0.008)	(0.004)
2005	-0.015**	-0.010	-0.021**	-0.019**	-0.011**	-0.011	-0.008**
	(0.006)	(0.024)	(0.009)	(0.007)	(0.004)	(0.008)	(0.003)
2006	-0.017**	-0.033	-0.022*	-0.020***	-0.012***	-0.021*	-0.009***
	(0.007)	(0.030)	(0.012)	(0.007)	(0.004)	(0.011)	(0.003)
2008	-0.014***	-0.047**	-0.019***	-0.012**	-0.009**	-0.010*	-0.008***
	(0.005)	(0.020)	(0.007)	(0.006)	(0.004)	(0.005)	(0.003)
2009	-0.022***	-0.077***	-0.028***	-0.025***	-0.013***	-0.020***	-0.012***
	(0.005)	(0.019)	(0.008)	(0.008)	(0.004)	(0.007)	(0.003)
2010	-0.017**	-0.041	-0.023*	-0.017*	-0.011*	-0.018	-0.009**
	(0.008)	(0.029)	(0.012)	(0.010)	(0.006)	(0.011)	(0.004)
2011	-0.012**	-0.037	-0.020**	-0.013*	-0.004	-0.012	-0.006*
	(0.006)	(0.026)	(0.009)	(0.008)	(0.005)	(0.007)	(0.003)
2012	-0.013**	-0.041	-0.020**	-0.014*	-0.005	-0.012*	-0.007*
	(0.006)	(0.026)	(0.008)	(0.008)	(0.006)	(0.007)	(0.003)
2013	-0.013**	-0.060***	-0.014	-0.012	-0.008	-0.010	-0.007**
	(0.006)	(0.019)	(0.009)	(0.007)	(0.005)	(0.007)	(0.003)
Tier	All	Ivy Plus	Elite	Highly Selective	Selective	All	All
Balance	2007	2007	2007	2007	2007	2007, 2009, 2013	2007
Observations	131,671	6,399	32,329	32,332	59,468	68,482	253,562
R-squared	0.567	0.650	0.559	0.565	0.438	0.550	0.574
Test 2009 = 2013						0.083	

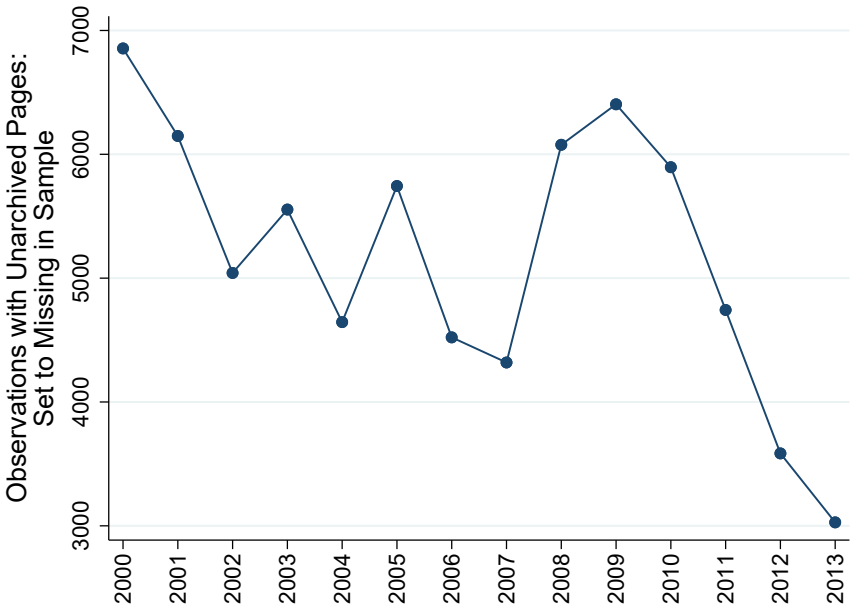
Notes: *** p-value $\leq$ .01, ** p-value $\leq$ .05, * p-value $\leq$ .1. This table shows coefficients corresponding to Figures 2, 3, and A.2. Dependent variable is an indicator for whether firm f recruits at university j in year t. All regressions include firm-university pair fixed effects. Standard errors are clustered at the firm and university level (except in column 2 where they are clustered only at the firm level due to a small number of universities). The regression includes only firm-university pairs with data in 2007, and except in column 7 only firms that recruit on at least one campus in the data throughout the sample period, and universities that attract at least one firm in the data throughout the sample period. Column 6 includes only firm-university pairs with data in 2007, 2009, and 2013. See text for details.

Figure A.2: **Changes in Recruiting Over Time, within Firm-University Pairs, Balance in 2007, 2009, 2013**



Notes: Dependent variable is an indicator for whether firm f recruits at university j in year t. Plot shows coefficients on year indicator variables, from a regression with firm-university pair fixed effects. Dashed lines show 95% confidence intervals, and standard errors are clustered at the firm and university level. The regression includes only firm-university pairs with data in 2007, 2009, and 2013, and only firms that recruit on at least one campus in the data throughout the sample period, and universities that attract at least one firm in the data throughout the sample period. See text for details.

Figure A.3: **Observations with Unarchived Pages**



Notes: Plot shows the number of firm-university pairs with *Recruit* equal to missing in the main sample, for reasons other than the website being blocked to robots or having nonworking links. In Appendix Table A.5 these are set to zero as this may reflect lack of recruiting. I include in the sum in this figure only firm-university pairs that would be in the regression sample. Specifically, I include those for which the firm recruited at least once during the sample, and the university attracted at least one firm during the sample, and the firm-university pair had data based on this alternative measure in 2007.

Table A.5: **Changes in Recruiting Over Time, within Firm-University Pairs**

Setting *Recruit* to Zero for Nonarchived Pages

	Recruit
2000	-0.022**
	(0.008)
2001	-0.026***
	(0.008)
2002	-0.024***
	(0.008)
2003	-0.025***
	(0.007)
2004	-0.025***
	(0.007)
2005	-0.017***
	(0.005)
2006	-0.015**
	(0.006)
2008	-0.016**
	(0.006)
2009	-0.019**
	(0.008)
2010	-0.015*
	(0.008)
2011	-0.014*
	(0.008)
2012	-0.013**
	(0.006)
2013	-0.006
	(0.006)
University Tier	All
Balance	2007
Observations	229,317
R-squared	0.386
Mean, $Recruit_{2007}$	0.044

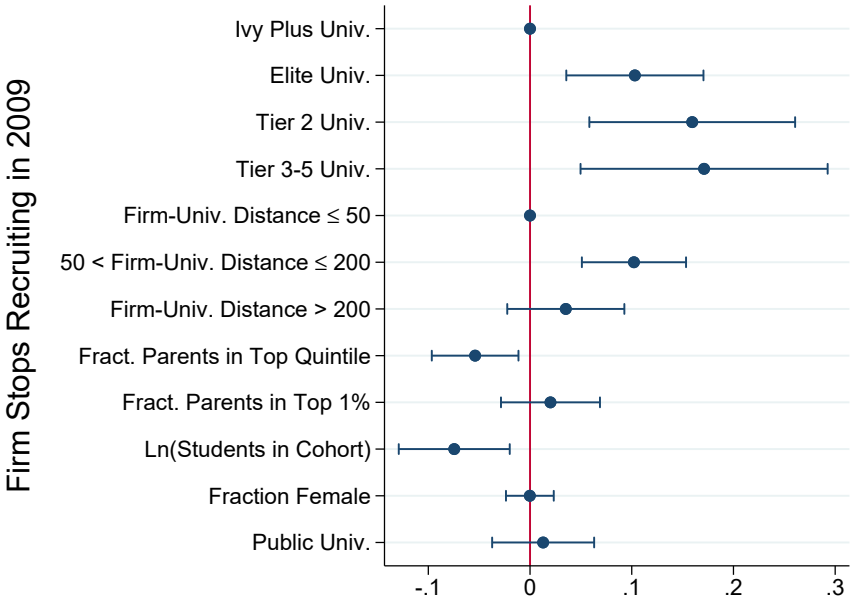
Notes: *** p-value $\leq$ .01, ** p-value $\leq$ .05, * p-value $\leq$ .1. This table shows results similar to those in Appendix Table A.4, but using a version of *Recruit* set to zero instead of missing if the recruiting page is nonarchived for reasons other than being blocked to robots or nonworking links. See Appendix Table A.4 and text for details.

Table A.6: **Losing and Regaining Access to Firms**

Dependent Variable	Dropped	Dropped or Missing	Return by 2011	Return by 2013	Return by 2011 Excl. if Miss Return	Return by 2013 Excl. if Miss Return
Ivy Plus			0.108**	-0.020	0.112	-0.052
			(0.048)	(0.131)	(0.068)	(0.105)
Elite	0.137**	0.103***				
	(0.052)	(0.033)				
Highly Selective (Tier 2)	0.267***	0.159***				
	(0.064)	(0.050)				
Selective (Tier 3-5)	0.285***	0.171***				
	(0.090)	(0.060)				
Firm-Univ. Distance $\in$ 50-200 Miles	0.121***	0.102***	-0.036	0.024	-0.056	0.038
	(0.030)	(0.025)	(0.036)	(0.073)	(0.068)	(0.080)
Firm-Univ. Dist. $>$ 200 Miles	0.044	0.035	-0.153***	-0.145*	-0.185***	-0.165*
	(0.048)	(0.029)	(0.054)	(0.076)	(0.069)	(0.090)
Fract. Parents in Top Income Quintile	-0.086**	-0.054**				
	(0.038)	(0.021)				
Fract. Parents in Top 1% of Income Dist.	0.017	0.020				
	(0.036)	(0.024)				
Ln(Students in Cohort)	-0.123***	-0.074***	0.025	0.036	0.020	0.026
	(0.040)	(0.027)	(0.027)	(0.037)	(0.033)	(0.042)
Fraction Female	-0.005	-0.000				
	(0.020)	(0.012)				
Public Univ.	-0.046	0.013				
	(0.043)	(0.025)				
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	435	733	237	237	172	204
R-squared	0.527	0.579	0.440	0.397	0.483	0.403

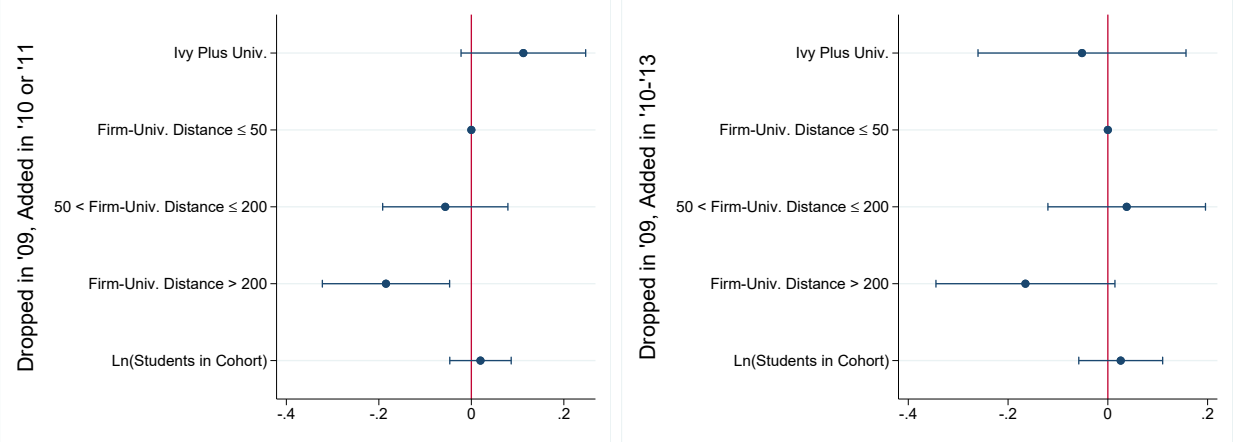
Notes: *** p-value $\leq$ .01, ** p-value $\leq$ .05, * p-value $\leq$ .1. Dependent variable in column 1 is an indicator for whether the firm was not recruiting on campus in 2009, but had recruited in 2007. In column 2, the dependent variable is an indicator for whether the firm was not recruiting on campus in 2009 or the recruiting variable was missing, but had recruited in 2007. Columns 1 and 2 include all firm-university pairs for which $Recruit = 1$ in 2007. The dependent variable is an indicator for whether the firm was recruiting on campus in 2010 or 2011 (column 3), or 2010 or 2011 or 2012 or 2013 (column 4), after not recruiting on campus in 2009, but recruiting in 2007. The sample includes all firm-university pairs for which $Recruit = 1$ in 2007 and $Recruit = 0$ in 2009. Standard errors are clustered at the university level. Columns 5 and 6 are the same as 3 and 4, but they exclude observations if $Return$ is missing due to missing recruiting variables. All regressions includes firm fixed effects. The following variables are standardized so they are mean zero and standard deviation one in the regression sample: fraction with parents in the top income quintile, fraction with parents in the top 1% of the income distribution, and fraction of the university cohort that is female. Standard errors are clustered at the firm and university level. We exclude universities for which the reporting of mobility report card variables is for multiple universities in a university system. We use covariate values corresponding to the 2007 cohort. See text for details.

Figure A.4: **Dropped Target Campuses in 2009, by University Characteristics, Treating Missing Recruiting as Dropped**



Notes: Plot shows coefficients on university characteristics, when the dependent variable is an indicator for whether the firm was not recruiting on campus in 2009 (recruiting was either coded as zero or missing), but had recruited in 2007. The sample includes all firm-university pairs for which $Recruit = 1$ in 2007. See text and notes to Figure 4 for details.

Figure A.5: **Campuses Added Back After Being Dropped in 2009, Setting Return to Missing if Recruit is Missing**



(a) Added Back 2010 or 2011 (b) Added Back 2010-2013

Notes: Plot shows coefficients on university characteristics, when the dependent variable is an indicator for whether the firm was recruiting on campus in 2010 or 2011 (A.5a), or 2010 or 2011 or 2012 or 2013 (A.5b), after not recruiting on campus in 2009, but recruiting in 2007. The sample includes all firm-university pairs for which $Recruit = 1$ in 2007 and $Recruit = 0$ in 2009. This differs from Figure 5 because *Return* is set to missing here if *Recruit* is missing. Standard errors are clustered at the university level. See text and Figure 5 for details.

Table A.7: **Firms in Sample, by Year**

Firm	Years in Sample
Banks	
ABN AMRO	2000-2007
Bank of America	2005-2007, 2012-2013
BNP Paribas	2001-2002, 2006-2007, 2013
Citi	2000-2009
Gleacher & Company	2000-2013
Houlihan Lokey	2000-2004, 2007, 2009-2013
HSBC	2004-2013
Jefferies & Company	2000-2013
JP Morgan Chase & Co.	2000, 2003, 2006-2007
Lazard	2000-2010
Macquarie Group	2000-2004, 2006-2009
Morgan Stanley	2001-2002, 2005-2009, 2011-2013
Perella Weinberg Partners	2006-2009, 2012-2013
Piper Jaffray Companies	2000-2005, 2007, 2010, 2012-2013
Raymond James Financial	2000-2002, 2004-2010, 2012-2013
Robert W. Baird & Co.	2007-2011
Rothschild	2002-2003, 2005-2008, 2011-2013
Thomas Wiesel Partners Group	2000, 2007-2009
U.S. Bancorp	2002-2004, 2006-2013
Wachovia	2000-2008
Consulting Firms	

Continued on next page

Table A.7 – continued from previous page

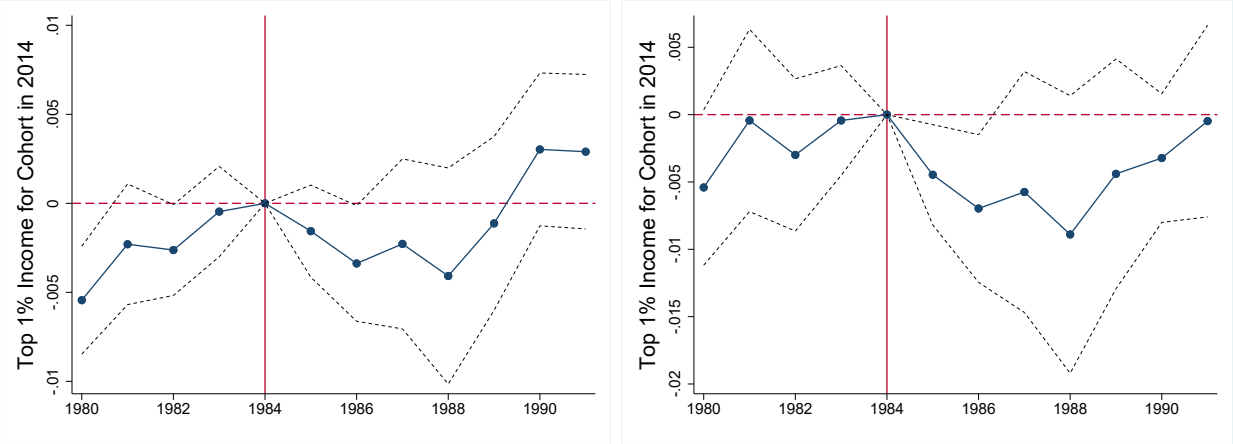
Firm	Years in Sample
A. T. Kearney	2004-2013
Analysis Group	2006-2013
Arthur D. Little	2003-2008, 2010, 2012-2013
Bain & Company	2000-2007, 2011-2012
BearingPoint	2007-2008
Booz Allen Hamilton	2000, 2006-2009, 2011-2013
Corporate Executive Board	2000-2008, 2010
Dean & Company	2000-2011
First Manhattan Consulting Group	2000-2008, 2010-2012
FTI Consulting	2000, 2004-2007, 2009, 2012-2013
Gallup	2000-2003, 2005, 2007-2013
Hewitt Associates	2000-2013
Huron Consulting Group	2002-2013
Kurt Salmon	2000, 2005-2011
Marakon	2000-2001, 2003-2013
McKinsey & Company	2007-2013
Mercer	2004, 2006-2011, 2013
Mitchell Madison Group	2003-2013
Navigant	2005-2010, 2012-2013
NERA Economic Consulting	2000, 2003, 2005-2013
OC&C Strategy Consultants	2004-2007, 2011-2013
Oliver Wyman	2001-2013
PA Consulting Group	2003-2005, 2007, 2009-2013
PRTM	2000-2010

Continued on next page

Table A.7 – continued from previous page

Firm	Years in Sample
Putnam Associates	2000-2009, 2011-2012
Roland Berger	2001-2002, 2006-2009, 2011-2013
The Boston Consulting Group	2001-2007, 2009-2013
ZS Associates	2000-2005, 2007-2012
Fortune 250 Firms	
ConAgra Foods	2002-2004, 2006-2008, 2010-2013
ConocoPhillips	2000-2002, 2004-2013
Eli Lilly	2001-2003, 2005-2013
General Electric	2000-2013
General Mills	2002-2010, 2012-2013
Goodyear Tire & Rubber	2001-2013
Halliburton	2004-2005, 2007-2013
Honeywell International	2000-2004, 2007-2008, 2010-2013
KBR	2004, 2007-2013
Kohl's	2002-2007, 2009-2012
Lowe's	2002-2008, 2010-2011
McKesson	2000-2002, 2006-2013
Monsanto	2000, 2002-2003, 2006-2010
National Oilwell Varco	2005-2013
Occidental Petroleum	2000-2001, 2004, 2006-2007, 2013
PPG Industries	2000-2001, 2006-2009, 2011-2013
Progressive	2000-2002, 2006-2008, 2011-2013

Figure A.6: **Effect of Losing Access to Prestigious Firms During the Recession**



(a) State-Tier-Cohort FE

(b) CZ-Tier-Cohort FE

Notes: Dashed lines show 95% confidence intervals. Standard errors are clustered at the university level. Dependent variable is the fraction of students in the birth cohort, parental income quintile cell at the university who earn in the top 1% of the income distribution for their birth cohort in 2014. Plots show coefficients on the interaction between birth cohort fixed effects and an indicator for the university losing access to at least one prestigious firm recruiting on campus between 2007 and 2009. Figure A.6b is the same as Figure 6, and shows results from a regression that includes CZ-university tier-birth cohort fixed effects and university fixed effects. Figure A.6a is the same, but instead includes state-university tier-birth cohort fixed effects and university fixed effects. See Figure 6 and text for details of the regression specification and included covariates.

Table A.8: **Changes in Likelihood of Top 1% Income, for Universities Losing Access to Prestigious Firms Between 2007 and 2009**

Y = Fraction of Students in Top 1% of Incomes for Birth Cohort				
1980*University Lost Access	-0.0054***	-0.0054***	-0.0054*	-0.0030
	(0.0015)	(0.0016)	(0.0029)	(0.0029)
1981*University Lost Access	-0.0023	-0.0021	-0.0004	0.0019
	(0.0017)	(0.0018)	(0.0034)	(0.0034)
1982*University Lost Access	-0.0026**	-0.0034**	-0.0030	-0.0024
	(0.0013)	(0.0013)	(0.0029)	(0.0027)
1983*University Lost Access	-0.0005	-0.0008	-0.0004	-0.0009
	(0.0013)	(0.0012)	(0.0021)	(0.0019)
1985*University Lost Access	-0.0016	-0.0019	-0.0045**	-0.0032*
	(0.0013)	(0.0012)	(0.0019)	(0.0018)
1986*University Lost Access	-0.0034**	-0.0035**	-0.0070**	-0.0043
	(0.0017)	(0.0016)	(0.0028)	(0.0027)
1987*University Lost Access	-0.0023	-0.0022	-0.0057	-0.0023
	(0.0024)	(0.0023)	(0.0045)	(0.0043)
1988*University Lost Access	-0.0041	-0.0037	-0.0089*	-0.0052
	(0.0031)	(0.0029)	(0.0052)	(0.0050)
1989*University Lost Access	-0.0011	-0.0013	-0.0044	-0.0005
	(0.0025)	(0.0023)	(0.0043)	(0.0045)
1990*University Lost Access	0.0030	0.0025	-0.0032	0.0018
	(0.0022)	(0.0022)	(0.0024)	(0.0036)
1991*University Lost Access	0.0029	0.0032	-0.0005	0.0050
	(0.0022)	(0.0023)	(0.0036)	(0.0047)
Observations	16,080	18,645	16,080	18,645
R-squared	0.8593	0.8532	0.8733	0.8687
Mean $Y_{1984,LostAccess}$	0.0519	0.0505	0.0543	0.0517
Balance	All	1984	All	1984
State-Cohort-Univ. Tier FE	Y	Y	N	N
CZ-Cohort-Univ. Tier FE	N	N	Y	Y
Univ. Losing Access in Same Area as Same-Tier Univ. not Losing Access	61	66	37	40

Notes: *** p-value $\leq$ .01, ** p-value $\leq$ .05, * p-value $\leq$ .1. Columns 1 and 3 of this table show the results for Appendix Figure A.6. Columns 1 and 3 include only universities with data for each cohort, while columns 2 and 4 include only universities with data for the 1984 birth cohort. See Figure 6, Appendix Figure A.6 and text for details of the regression specifications and included covariates.

Table A.9: **Differential Changes in University Characteristics, for Universities Losing Access to Prestigious Firms Between 2007 and 2009**

	Share with Parents in Income Quintile					Share with Parent Income in Top					
	1	2	3	4	5	10%	5%	1%	0.10%	Ln(Students)	Share Female
1980*University Lost Access	0.0008	-0.0067*	-0.0044	0.0056	0.0047	0.0009	-0.0019	0.0008	0.0005	0.0261	-0.0033
	(0.0034)	(0.0036)	(0.0035)	(0.0051)	(0.0082)	(0.0077)	(0.0058)	(0.0023)	(0.0006)	(0.0223)	(0.0077)
1981*University Lost Access	-0.0022	-0.0040	-0.0015	-0.0009	0.0086	0.0035	0.0011	0.0004	-0.0004	-0.0235	-0.0045
	(0.0024)	(0.0039)	(0.0036)	(0.0052)	(0.0068)	(0.0058)	(0.0051)	(0.0025)	(0.0007)	(0.0229)	(0.0073)
1982*University Lost Access	-0.0010	-0.0082**	-0.0043	0.0041	0.0094	0.0072	-0.0034	-0.0027	-0.0012*	-0.0342**	0.0003
	(0.0023)	(0.0034)	(0.0035)	(0.0039)	(0.0064)	(0.0067)	(0.0052)	(0.0027)	(0.0006)	(0.0155)	(0.0078)
1983*University Lost Access	0.0025	-0.0025	-0.0052	0.0001	0.0051	0.0054	0.0025	0.0019	0.0006	-0.0133	0.0056
	(0.0033)	(0.0034)	(0.0042)	(0.0040)	(0.0050)	(0.0049)	(0.0035)	(0.0018)	(0.0006)	(0.0152)	(0.0054)
1985*University Lost Access	-0.0009	0.0020	0.0073***	-0.0069*	-0.0014	0.0014	-0.0027	0.0049**	0.0009*	-0.0634***	-0.0048
	(0.0027)	(0.0034)	(0.0027)	(0.0037)	(0.0044)	(0.0037)	(0.0032)	(0.0021)	(0.0005)	(0.0124)	(0.0059)
1986*University Lost Access	0.0021	0.0009	0.0073**	0.0023	-0.0125**	-0.0056	-0.0066*	0.0036*	0.0009	-0.0664***	-0.0004
	(0.0030)	(0.0034)	(0.0033)	(0.0041)	(0.0055)	(0.0037)	(0.0035)	(0.0019)	(0.0009)	(0.0169)	(0.0054)
1987*University Lost Access	0.0046	0.0010	0.0030	-0.0015	-0.0070	-0.0050	-0.0063	0.0042*	-0.0001	-0.0886***	-0.0128**
	(0.0029)	(0.0033)	(0.0028)	(0.0036)	(0.0056)	(0.0048)	(0.0051)	(0.0025)	(0.0008)	(0.0213)	(0.0056)
1988*University Lost Access	0.0065**	0.0020	0.0058	-0.0045	-0.0097	0.0007	-0.0028	0.0043*	0.0005	-0.0680***	-0.0121
	(0.0029)	(0.0043)	(0.0049)	(0.0049)	(0.0081)	(0.0060)	(0.0060)	(0.0024)	(0.0007)	(0.0254)	(0.0082)
1989*University Lost Access	0.0021	0.0050	0.0108**	0.0002	-0.0181*	-0.0133	-0.0115*	0.0013	0.0010	-0.0969***	-0.0145*
	(0.0042)	(0.0051)	(0.0048)	(0.0048)	(0.0096)	(0.0082)	(0.0065)	(0.0033)	(0.0007)	(0.0292)	(0.0074)
1990*University Lost Access	0.0059	0.0063	0.0131***	0.0023	-0.0276**	-0.0197*	-0.0125	0.0020	0.0006	-0.1215***	-0.0181**
	(0.0047)	(0.0054)	(0.0046)	(0.0053)	(0.0114)	(0.0110)	(0.0085)	(0.0032)	(0.0009)	(0.0285)	(0.0072)
1991*University Lost Access	0.0084*	0.0055	0.0087*	-0.0006	-0.0220*	-0.0139	-0.0075	0.0065**	0.0018*	-0.1314***	-0.0090
	(0.0048)	(0.0053)	(0.0047)	(0.0054)	(0.0121)	(0.0122)	(0.0085)	(0.0030)	(0.0009)	(0.0386)	(0.0065)
Observations	16,080	16,080	16,080	16,080	16,080	16,080	16,080	16,080	16,080	16,080	16,080
R-squared	0.9839	0.9849	0.9818	0.9848	0.9935	0.9948	0.9953	0.9942	0.9809	0.9989	0.9900
CZ-Tier-Cohort FE	Yes										
University FE	Yes										

Notes: *** p-value $\leq$ .01, ** p-value $\leq$ .05, * p-value $\leq$ .1. This table shows the results from estimating equation (5), but using the characteristics X as dependent variables. All columns include a balanced sample, CZ-university selectivity tier-birth cohort fixed effects, and university fixed effects. See text for details.