Superstar (and Entrepreneurial) Engineers in Finance Jobs*

Nandini Gupta and Isaac Hacamo†

March 2018

Abstract

Does rapid wage growth in the financial sector in recent decades attract scarce talent to finance, thereby affecting talented workers' long-term career paths? To study this question we focus on the careers of elite engineers, whose skills are in demand across the economy and who have the potential to become transformative entrepreneurs. Using plausibly exogenous variation in local financial sector growth, we compare U.S. engineering graduates from 12 top schools in the same graduating class and major, and show that engineers from higher ranked schools, and those with graduation honors, are more likely to switch from other sectors to finance. We find that financial sector growth attracts highly talented engineers into financial sector occupations that do not fully use their skills, which leads these engineers to engage in less innovative entrepreneurship in the long-run, compared to their classmates who remain in engineering. Our results are robust to alternative specifications, including a measure of geographic location based on engineers' hometowns.

JEL Codes: G2, G20, J2, J3, J31, M52, N2
Keywords: Finance and labor; Talent allocation; Superstars; Human capital; Careers in finance; Financial sector growth; Entrepreneurship; Innovation.

*This paper benefited from valuable comments from Sanjai Bhagat, Steve Billings, Matt Billett, Philip Bond, Miguel Ferreira, Rene Garcia, Raphael Godefroy, Vincent Glode, Eitan Goldman, Radha Gopalan, Sreeni Kamma, Kristoph Kleiner, Camelia Kuhnen, Hamid Mehran, Paige Ouimet, Thomas Philippon, Francisco Queiró, Uday Rajan, Jacob Sagi, Paola Sapienza, Sebastian Stumpner, Zhenyu Wang, Xinxin Wang, Wenyu Wang, Ed Wesep, and Jaime Zender. In addition, we thank seminar and conference participants at Finance and Labor Group Meeting at ASU, University of Colorado at Boulder (Finance), University of Montreal (Economics), PBC School of Finance at Tsinghua University, NOVA School of Business and Economics, University of North Carolina at Chapel Hill (Finance), Indiana University, and the Olin School Corporate Finance Conference at Washington University St. Louis for helpful comments.

†Department of Finance, Kelley School of Business, Indiana University. Emails: nagupta@indiana.edu and ihacamo@indiana.edu

1 INTRODUCTION

Individuals with the potential to excel in their field, such as superstar inventors and entrepreneurs, are in limited supply and hold skills that are also in demand in other sectors.[1] One such sector is financial services, where recent evidence has documented rapid wage growth for skilled workers starting in the 1980s (Philippon and Reshef 2012; Boustanifar, Grant, and Reshef 2017). Theoretically, high wages in the financial sector may attract superstar talent from the rest of the economy (Bond and Glode 2014; Axelson and Bond 2015; Glode and Lowery 2015; Benabou and Tirole 2016), however empirical evidence on this topic is limited.[2] If talented workers switch to finance from other fields, how may this affect their careers in the long run? While an early career move to the financial sector may help skilled individuals gain preferential access to financing (Petersen and Rajan 1994; Engelberg, Gao, and Parsons 2012), which can increase the likelihood of entrepreneurship (Guiso, Sapienza, and Zingales 2004; Adelino, Schoar, and Severino 2015; Babina, Ouimet, and Zarutskie 2016), it may also result in a loss of specialized skills, which may reduce the likelihood of becoming an innovative entrepreneur. To study these issues, we examine whether financial sector growth attracts talented individuals from non-finance fields, whether these individuals are matched to occupations in finance that use their specialized education, and the impact of this early career decision to switch to finance on their likelihood of subsequently becoming a transformative entrepreneur.

Using résumé data on about 70,000 engineers who graduated from 12 top-ranked U.S. engineering schools between 1998 and 2008,[3] to the best of our knowledge, we are the first to show the following results. First, we find that financial sector growth attracts exceptionally talented engineers from other sectors, which is consistent with the theoretical argument that the finance wage premium for skilled workers is driven by increased competition for scarce talent. Second, we find that talented engineers are more likely to be employed in finance-specific rather than engineering-specific occupations in the financial sector, indicating that these individuals may not use their engineering skills in finance.[4] Third, we show that an early career decision to switch to a high wage sector reduces the likelihood that a talented engineer will become an innovative entrepreneur,

[1] For example, Malmendier and Tate (2009) note that compensation, status, and press coverage of CEOs is highly skewed, with a few "superstars" dominating the rewards and headlines. Azoulay, Graff Zivin, and Wang (2010) study the highly skewed distribution of scientific contributions, in which a "tiny" number of scientists make the bulk of contributions. Baumol, Schilling, and Wolff (2009) compile a list of "superstar" inventors and entrepreneurs from Anglo-American sources, covering a 400 year period, which consists of just 513 individuals.

[2] As we discuss in Section 1.1. below, recent studies, that use individual level data to study the characteristics of financial sector workers, do not show that finance attracts more talented workers (Célérier and Vallée 2017; Shu 2016; Böhm, Metzger, and Strömberg 2016).

[3] We observe engineering graduates from Caltech, CMU, Cornell, Georgia Tech, MIT, Northwestern, Stanford, UC Berkeley, UCLA, Illinois, UT Austin, and Wisconsin. These universities are ranked in the top 20 of all U.S. engineering programs throughout the sample period (according to *U.S. News and World Report*), are geographically dispersed across the United States, and represent both public and private institutions.

[4] If talented engineers switch to financial sector occupations that do not require engineering skills, this can create an inefficient education-occupation mismatch due to the talent shortfall in other sectors. The inefficiency will be greater if engineers lack financial sector knowledge - what Warren Buffett referred to as "Beware of Geeks bearing bonds".

suggesting that these individuals may lose their engineering-specific skills in financial sector jobs.[5]

We study the career paths of talented engineers because engineering graduates receive the highest salaries of any undergraduate college major in the U.S. (Carnevale, Cheah, and Hanson 2015), indicating a high demand for these skills in the economy.[6] Moreover, according to a recent survey, the majority of U.S. inventors have an engineering degree (Walsh and Nagaoka 2009).[7] Our sample for instance includes the founders of Yelp, Dropbox, and Khan Academy, among others. Both the anecdotal and aggregate evidence supports our hypothesis that financial sector growth has led to increased demand for engineers in finance.[8] In particular, aggregate data from the Current Population Survey indicates that in the 1970s and 1980s, before the onset of financial sector growth, there was little movement of engineers to finance; starting in the mid-1990s, however, an increasing number of engineers began to take financial sector jobs.

To identify the effect of financial sector growth on the career choices of talented engineers, we exploit the unprecedented economy-wide growth in the finance industry over the last three decades as a shock to individual U.S. regions.[9] Specifically, we identify regions that are predisposed to be more affected by this national trend by estimating the proportion of college-educated workers employed in finance in each metropolitan area in 1990, prior to the beginning of the growth spurt in the financial sector. We argue that regions with a greater share of financial sector employment are likely to experience higher financial sector growth due to the national trend. Controlling for a battery of metro-level characteristics, we compare two classmates—same school, major, and graduation year—who work in similar-sized firms in the same non-financial sector, located in comparable metropolitan areas that differ in financial sector presence. This empirical strategy is similar in spirit to Bartik (1991). Using our rich dataset, we then examine whether an engineer employed in a non-financial sector job, located in a metro area with a high share of financial sector employment in 1990, is more likely to switch to finance.[10]

We conduct additional analyses to establish that our results capture engineers who move to finance because of financial sector growth, instead of engineers being "pushed" from declining

[5] We do not observe the effect of these career changes on aggregate entrepreneurship, which may be positive if engineers working in finance provide financing to entrepreneurs. However, a Kauffman Foundation report notes that the average annual startup rate has declined between the 1980s and 2000s, as has net job creation by new firms (Kedrosky and Stangler 2011).

[6] A recent government report notes that the United States would need to produce 1 million new engineers and other STEM professionals over the next decade to match demand (President's Council of Advisors on Science and Technology 2012), and the shortage is most acute in the private sector (Bureau of Labor Statistics 2015).

[7] Acs, Astebro, Audretsch, and Robinson (2016) argue that education policy that leads to more engineers may be effective for increasing entrepreneurship.

[8] Before the 2008 crisis, a third of MIT's engineers ("The jobs that really smart people avoid", *The Washington Post*, January, 17, 2017) and 10% of Carnegie Mellon's engineering class ("Carnegie Mellon's Top Grads Land Jobs in Financial Sector", Carnegie Mellon University, 2008) found jobs in finance. Aggregate data from the 2010 U.S. Census indicate that STEM graduates are the third-largest major employed in business and financial services (U.S. Census, 2011). In our data, about 10% of engineers move to the finance industry within five years of graduation.

[9] Greenwood and Scharfstein (2013) note that over the last 30 years, the financial services sector has experienced rapid growth measured in terms of average wages, employment, share of GDP, and the quantity of financial assets.

[10] In the regression sample, we only consider engineers who choose a non-financial industry job at graduation, since engineers who move to finance right after graduating may do so because they prefer to work in finance, or do not wish to work in engineering.

firms into finance, or engineers with a preference for finance who select non-financial sector jobs located in metros with high financial sector presence. In particular, we estimate a firm fixed-effects specification, comparing engineering classmates who work for the same firm but in branches located in different metro areas; estimate our specification for subsamples that exclude the major financial centers of New York, Connecticut, and Chicago; and identify an alternative location measure based on the engineers' hometowns to examine career choices based on hometown exposure to finance. We also present several tests suggesting that our design does not violate the exogeneity condition.[11]

Our data from a prominent online business networking site covers over 90% of the cohort size for the 12 top U.S. engineering schools in our sample, on average. Using this data, we find that financial sector growth leads engineers from these top-ranked schools to switch from non-financial sector jobs to the financial services sector. For example, relative to the sample mean likelihood of moving to finance of 5%, an engineer working in a *high-finance-growth* metro area (75^{th} percentile of finance employment share) is 32% more likely to move to finance from a different sector compared to an engineer working in a *low-finance-growth* metro area (25^{th} percentile of finance employment share). Moreover, these effects are larger for metro areas with a higher concentration of securities rather than credit intermediation firms, which is consistent with the fact that investment banking typically pays more than commercial banking. We also show that the decision to switch to the financial services sector is robust to an alternative measure of location that is less subject to the concern of geographic selection - engineers' hometowns. Engineers who grew up in metro areas with greater financial sector employment are more likely to switch to financial sector jobs, despite taking a non-finance job after graduation.

We find that financial sector growth attracts highly talented individuals to finance. While the labor economics literature typically measures ability using coarse educational attainment measures, we use our rich dataset to distinguish between the quality of schools and also measure skill heterogeneity within schools. Specifically, using school rank calculated based on acceptance rates, we find that graduates of more selective engineering schools are significantly more likely to switch to finance jobs in *high-finance-growth* areas. To further examine whether the best students from the top schools move to finance, we hand collect data on graduation honors from commencement programs supplemented with self-reported data, and show that engineers who graduate with honors are significantly more likely to switch from other sectors to finance compared to those who graduate without honors.[12]

Using granular occupational data, we find that engineers, particularly those from higher-ranked schools, are more likely to be hired into financial sector occupations that do not use their engineering

[11] First, to examine whether our results are affected by the self-selection of engineers into *high-finance-growth* areas, we show that engineers from top schools, those who graduate with honors, and innovative entrepreneurs are not more likely to be located in *high-finance-growth* metros. Second, we show that metro-level employment growth in non-financial industries that employ the engineers in our sample is not significantly correlated with the share of college-educated workers employed in finance in 1990 in that area, indicating that our results are not explained by the endogenous location of engineering firms in *high-finance-growth* metros.

[12] The literature has shown that attending more selective colleges (Hoekstra 2009), and receiving Latin honors (Khoo and Ost 2017), is positively associated with earnings, suggesting that these measures capture individual ability.

skills. Identifying financial sector occupations as *Engineering-specific* (e.g. Software, Network Engineering) and *Finance-specific* (e.g. Trader, Portfolio Manager, Analyst, and Investment Banker), where the latter occupations do not require an engineering degree, we show that 82% of engineers from higher-ranked schools who move to the financial sector work in *Finance-specific* occupations, while only 18% work in *Engineering-specific* occupations.

More than 12% of all engineers in our data from higher-ranked schools become entrepreneurs during the sample period. Does an early career move to the financial sector affect a talented engineer's likelihood of becoming an entrepreneur in the long-run? While engineers who switch to finance jobs early in their career may lose their engineering-specific skills, a job in the finance industry may also provide preferential access to capital, thereby facilitating entry into entrepreneurship.

We identify all firms created or co-founded by the engineers in our sample, and to capture entrepreneurial ventures in which engineers use their technical training, we also identify innovative ventures with data on the patents created by these firms. Using a difference-in-differences specification, which controls for the selection of engineers into *high-* and *low-finance-growth* metros, we obtain the following results: First, engineers from all schools who move to the financial sector from the non-financial sector in *high-finance-growth* metros are significantly less likely to become entrepreneurs than their classmates, in *high-* or *low-finance-growth* metros, who did not move to finance. Second, engineers from all schools who move to the financial sector in *high-finance-growth* metros are significantly less likely to subsequently found an innovative firm (with at least one patent). Third, engineers from higher ranked schools, who move to finance due to financial sector growth, are significantly less likely to become founders of innovative firms, compared to their classmates who remain in engineering. These results are robust to using the alternative hometown location measure.

We also conduct several robustness checks. First, we show that the movement of engineers to the financial sector is not driven by engineers who work in declining manufacturing industries. Second, to examine whether engineers from higher-ranked schools are more likely to switch jobs due to greater demand for high-ability workers than due to financial sector growth, we consider transitions to high-paying management consulting jobs in *high-finance-growth* metro areas, and do not find any evidence of moves to management consulting in these areas. Third, we extend our analysis to examine transitions to finance jobs during the financial crisis (2008-2010) and the subsequent post-crisis years (2011-2016), and observe a decline in the movement of engineers in *high-finance-growth* areas relative to *low-finance-growth* areas during the financial crisis, which supports our hypothesis that the pre-crisis results are driven by financial sector growth. However, the movement of engineers to the financial sector resumes in the post-crisis period, indicating that this is an ongoing trend.

1.1 Related literature

Our paper contributes to the growing literature on compensation and human capital in the financial services sector. In particular, Philippon and Reshef (2012) show that wages are 50% higher in financial services compared to other sectors for similarly educated workers; and Oyer (2008) estimates that Stanford MBAs working in the financial sector earn between $1.5 to $5 million more in present value terms than their classmates in other industries. Among theoretical papers that study the causes of high pay, Glode and Lowery (2015) show that firms will pay a premium to hire skilled traders who can appropriate a greater share of the surplus in a zero-sum trading game; Bond and Glode (2014) present a dynamic labor market model suggesting that higher pay leads talented financial regulators to switch to banking jobs mid-career; and Axelson and Bond (2015) argue that high pay may be a response to moral hazard problems in finance. Empirically, Philippon and Reshef (2012) show that financial deregulation explains the rapid wage growth in the sector; Boustanifar, Grant, and Reshef (2017) use cross-country data to show that deregulation explains the growth in finance wages relative to other sectors; and Kaplan and Rauh (2010) argue that high wages in finance are best explained by skill-biased technological change, which increases the productivity of "superstars", allowing them to apply their skills on a larger scale.[13] To the best of our knowledge, we are the first to provide empirical support for the "superstar" explanation for high wages, by showing that financial sector growth attracts highly talented engineers from non-financial sector jobs.

We also contribute to a recent literature that uses individual-level data to examine the causes of high pay in finance and characteristics of finance workers (Célérier and Vallée 2017; Böhm, Metzger, and Strömberg 2016; Shu 2016). Using repeated cross-sections of data on French engineers, Célérier and Vallée (2017) show that the increase in finance wages in their sample is explained by higher returns to skill in finance, and skilled workers in finance earn a wage premium relative to other sectors, but they do not study whether finance attracts more skilled workers. In contrast, we take the finance wage premium as given, and study whether finance attracts more talented workers. Böhm, Metzger, and Strömberg (2016) using Swedish data on wages and talent measures based on military enlistment tests find no evidence that finance workers are more talented than workers in other sectors. While their findings indicate that on average workers across all occupations in the financial sector, including clerical workers, are not more talented, we focus on individuals who are likely to take the highest-paid jobs in the field, and find that financial sector growth attracts more talented individuals. Also related to our study, Shu (2016) finds that MIT engineers who take jobs in finance at graduation do not develop skills that are suitable for engineering careers. While Shu (2016)'s sample captures an early preference for finance and shows that such a preference may affect individuals' academic choices prior to graduation, we examine engineers from twelve schools, who take engineering jobs after graduating and then move to finance due to financial sector growth, and study the long-run career impact of this move.

Our paper also adds to the literature that studies the impact of early career economic conditions on long-run career outcomes. For example, Oyer (2008) shows that the stock market conditions at the time when MBA students enter the job market, affect their likelihood of entering the financial

[13] Several studies also show that financial sector compensation has contributed to the increase in wage inequality in developed countries in recent decades (Kaplan and Rauh 2010; Philippon and Reshef 2012; Bell and Van Reenen 2013; Bell and Van Reenen 2014).

sector, which has an impact on long-term earnings. Altonji, Kahn, and Speer (2016) show that U.S. college students who start their careers during a recession experience an initial decline in earnings, but the effect dissipates in the long-run. In contrast, Kahn (2010) finds that bad economic conditions when college graduates enter the labor market have long-run negative wage effects. Lastly, Schoar and Zuo (2017) show that economic conditions at the start of managers' careers have lasting effects on their managerial styles. We show that engineers who switch to finance during periods of rapid financial sector growth, are less likely to become innovative entrepreneurs in the long-run compared to their classmates who remain in engineering professions.

Our paper is also related to the labor economics literature on education-occupation mismatch. For example, Robst (2007) finds that mismatched workers earn less than adequately matched workers with the same amount of schooling. Altonji, Blom, and Meghir (2012) develop a sequential model of education major and occupational choice and using data from the *American Community Survey* show that engineers have some of the highest SAT scores among all graduates and earn a consistent wage premium relative to other majors. Ransom and Phipps (2016) show that education-occupation mismatch has increased in recent years, even for occupation-specific majors such as engineering. Our results provide insight into this finding by showing that financial sector growth attracts engineers, contributing to the increase in mismatch.

2 EMPIRICAL DESIGN

Below we describe our baseline specification, which examines whether financial sector growth attracts talented engineers to finance. We also describe alternative specifications including firm fixed-effects, sub-sample tests, and alternative explanatory variables.

2.1 Baseline Identification

A naive regression using economy-wide measures of the relative share of engineers employed in finance on relative wage growth in finance will be confounded by the contemporaneous decline in U.S. manufacturing (Pierce and Schott 2016), or, if engineers switch jobs because of individual preferences, by reverse causality. To address these endogeneity concerns, we use the unprecedented growth in the finance industry starting in the mid-1990s as a shock to metro areas across the United States.[14] Specifically, we identify metro areas that are predisposed to be more affected by the national trend by estimating the proportion of college-educated workers employed in finance in each metropolitan area in 1990, prior to the economy-wide increase in finance wages and employment. We then argue that regions with a greater pre-existing presence of financial sector employment are

[14] Greenwood and Scharfstein (2013) estimate that value added as a share of GDP for the financial services sector rose from 4.9% in 1980 to a peak value of 8.3% in 2006, with the rate of growth increasing rapidly starting in the 1980s. In Figure 1 of their study they observe that the financial sector's value added share of GDP grew at an average 13 basis points per year starting in 1980, which is faster than the 7 basis points growth per year on average over the previous 30 years. Philippon (2015) shows that domestic income of financial intermediaries as a share of GDP grew slowly from 4% in 1950 to 5% in 1980, but increased rapidly after 1980 (Figure 2).

more likely to be affected by the nationwide growth in the financial sector than regions with a low initial presence of financial sector employment. This empirical strategy is similar in spirit to Bartik (1991) and others.[15]

To investigate whether our explanatory variable captures current financial sector growth, we examine whether the proportion of college-educated workers employed in finance in a metropolitan area in 1990 is correlated with subsequent financial sector growth. In column (1) of Table 2, Panel A, we report regression estimates that show that metro-area financial-sector presence in 1990 is significantly correlated with post-2000 metro-area financial sector growth.

We exclusively compare engineers who graduated in the same year-school-major, and choose to work (after graduation) in similar-sized non-finance firms in the same industry (3-digit NAICS). Specifically, we compare an engineer who graduated from Stanford in 2000 and majored in Chemical Engineering only with other Stanford engineers who graduated in the same year with the same major. By also including a battery of metro-level control variables, this specification allows us to compare two classmates who decide to work in similar-sized non-finance firms in comparable metropolitan areas that differ in financial sector presence.

Our empirical design tests whether engineers who (i) graduated between 1998 and 2006 and (ii) work in non-finance firms located in metro areas that had a larger financial sector presence in 1990 are more likely to switch to financial sector jobs between 2000 and 2008. We also estimate the specification using post-crisis data from 2008 to 2016 in a robustness test. The main explanatory variable of interest is *MSA Finance Share in 1990*, the employment share of college-educated workers in finance in 1990 in the metropolitan area where the headquarters of the non-financial firm is located. Fundamental to our identification is the inclusion of school-major-graduation year fixed effects that ensure the comparison of similar engineers. Specifically, we estimate the following linear probability regression model:

$$\begin{aligned} \text{Prob. Switch to Finance}_i &= \beta_1 \times \text{MSA Finance Share in 1990}_i \\ &+ \text{MSA Controls} \\ &+ \text{School-Graduation year-Major FE} \\ &+ \text{Firm Size Class FE} \\ &+ \text{3-Digit NAICS FE} + \varepsilon_i, \end{aligned} \tag{1}$$

where *MSA controls* include metropolitan population size in 2000, total employment growth in the metro area from 2000 to 2006, the share of college-educated workers in the metro area, and metro-level employment share in 2000 and growth from 2000 to 2008 of the 3-digit NAICS industry of the firm where individual i is employed. With the latter two controls, we control for the extent

[15]By averaging national employment growth across industries using local industry employment shares as weights, the Bartik (1991) methodology produces a measure of local labor demand that is unrelated to changes in local labor supply. Card (1992) uses a similar technique to study the effect of changes in the federal minimum wage on the labor supply of adolescents.

to which an industry-specific decline pushes engineers into finance. We also separately include the employment share of college-educated workers in securities (3-digit NAICS category 523) and credit intermediation (3-digit NAICS category 522) firms in the MSA in 1990 as explanatory variables. The firm-size fixed effect is based on three classes of employment (below 1,000, between 1,000 and 10,000, and above 10,000 employees). Lastly, we consider finance employment share in the metro area in 1980 as an additional explanatory variable. Note that the standard errors are clustered at the MSA level throughout the analysis.

2.2 Exogeneity of MSA Finance Share

Below, we conduct additional analyses to address the exogeneity of our explanatory variable. First, to investigate whether there is self-selection of engineers into metro areas with significant financial sector presence, from columns (2) and (3) of Table 2 Panel A, we note that metro-level employment growth in the 2000s in the industries that hire the most engineers in our sample—manufacturing and professional services—is not significantly correlated with *MSA Finance Share in 1990*. We also show that our results are robust to using an alternative definition of location, engineers' hometowns, which we describe further in Section 2.2.2 below. Further, from Table 2, Panel B we note that talented engineers and entrepreneurs are not more likely to be located in metro areas with a higher financial-sector presence, as suggested by the lack of significant correlation between the likelihood that an engineer graduated from a top-ranked school, received honors, or created an innovative firm as a function of *MSA Finance Share in 1990*. Taken together, these results alleviate the concern that our results are driven by the self-selection of talented engineers into metro areas with significant financial sector employment.

The proportion of college-educated workers employed in finance in a metropolitan area in 1990 might lack cross-sectional variation, if only a handful of cities, such as New York and Chicago, had a significant financial sector presence in 1990, leading to a test with low statistical power. Figure 2 alleviates this concern by showing that the dispersion of finance presence in 1990 reaches almost 200 metro areas. Furthermore, from Table 1, we note that the average metro-level financial-sector presence in 1990 is 3.1%, and the 10^{th} and 90^{th} percentiles are 1.6% and 4.7% respectively, which does not indicate a significant degree of skewness. We also estimate the specifications using a subsample that excludes the country's major financial centers, described in Section 2.2.3 below, and find that our results are unchanged.

2.2.1 Controlling for firm fixed effects

We extend Specification (1) by comparing engineering classmates who work in branches of the same non-finance firm located in different metro areas. Comparing engineers who work for the same firm holds firm characteristics constant across workers, which mitigates the concern that engineers are pushed to finance jobs from declining firms. The rationale is that if a firm is in declining financial health, this should impact employees across branches. This specification may also address the issue of geographic self-selection if firms allocate young workers to branches based on the firm's needs.

Specifically, we estimate a linear probability specification similar to Specification (1) using firm-level fixed effects instead of firm size fixed effects, and with school-graduation year-major fixed effects. The regression is restricted to firms that have at least 5 employees and at least two branches as observed in our database. The sample in this regression is smaller than in our baseline specification because there are fewer firms with multiple branches, and we only identify the branch location of an employee when they report it in their résumé.

2.2.2 Hometown location

To further alleviate the concern that engineers with a preference for finance jobs may self-select into non-financial sector jobs in metro areas with a high concentration of finance employment, we use engineering graduates' hometowns as an alternative measure of location. Engineers might be exposed to the growth in the finance industry through family and friends in their hometown, influencing them to switch to the financial sector after initially taking a job in a non-finance firm. The advantage of this measure is that individuals are less likely to choose their hometown or base this choice on the presence of finance employment in the area.

To construct the alternative location measure, we hand collect data on the hometown locations of engineering graduates from the commencement programs of two universities, Stanford University and California Institute of Technology.[16] We then test whether engineers whose hometown is in a metro area with a larger financial-sector presence in 1990 are more likely to switch to the financial sector between 2000 and 2008. The main explanatory variable of interest is *MSA Hometown Finance Share in 1990*, the employment share of college-educated workers in finance in 1990 in the engineer's hometown metropolitan area. Note that only hometown locations that belong to a MSA (defined as 100,000 people or more) are included. Specifically, we estimate a linear probability specification similar to Specification (1) using *MSA Hometown Finance Share in 1990* as the main explanatory variable.

2.2.3 Excluding financial centers

Throughout the analysis, we focus on engineers who first choose a non-financial sector job at graduation, excluding engineers who demonstrate a preference for a career in finance by choosing financial sector jobs upon graduation. However, engineers who may temporarily choose a non-finance job as a step towards eventually finding a job in the financial sector might choose to work in a major financial center. To alleviate this concern, we estimate Specification (1) after excluding the major financial centers of New York (including adjacent localities in New Jersey), Chicago, and the Bridgeport-Stamford-Norwalk metro area in Connecticut.

[16] We also have commencement programs from Northwestern University, but these do not include graduates' hometown information.

2.2.4 Comparing cohorts over time

We extend Specification (1) by including moves to finance jobs over different time periods to establish that the magnitude of the measured effects is driven by finance growth in the metro area and not the initial metro-area distribution of employment in finance versus other industries. Additionally, to establish that we measure moves to finance due to financial sector growth, we compare peak financial sector growth years (2006-2007) to non-peak years (2000-2001). Adding the time periods provides difference-in-difference estimates of the results in Specification (1). Specifically, we estimate the following linear probability specification:

$$\begin{aligned} \text{Prob. Switch to Finance}_i \;=\; & \beta_1 \times \text{Cohort } 04\&05_i \times \text{ MSA Finance Share in } 1990_i \\ & +\beta_2 \times \text{Cohort } 04\&05_i \\ & +\beta_3 \times \text{ MSA Finance Share in } 1990_i \\ & +\text{MSA Controls} \\ & +\text{School-Year-Graduation-Major FE} \\ & +\text{Firm Size Class FE} \\ & +\text{3-Digit NAICS FE} + \varepsilon_i, \end{aligned} \tag{2}$$

where *Cohort* $04\&05_i$ equals one if an engineer graduated in 2004 or 2005, and zero if an engineer graduated in 1998 or 1999. *Prob. Switch to Finance*$_i$ equals one if engineer i who graduated in 2004 or 2005 moves to finance in 2006 or 2007, and if engineer i who graduated in 1998 or 1999 moves to finance in 2000 or 2001. The coefficient β_1 captures whether individuals who graduated between 2004 and 2005 are more likely to switch to a finance sector job between 2006 and 2007 (peak finance growth years), from non-finance jobs in a *high-finance-growth* metro, than those who graduated between 1998 and 1999 are to switch to a finance job between 2000 and 2001 (non peak years). Note that this specification controls for metro-area characteristics, such as initial industrial distribution, by comparing cohorts across years in the same metro area.

2.3 Talented workers

The labor economics literature has typically measured talent using coarse measures of educational attainment, such as level of schooling. Using our detailed data, we investigate whether growth in the financial sector attracts superstar talent in two ways: First, we split the sample into engineers from higher- and lower-ranked schools and compare the estimates from the two subsamples, which is equivalent to a difference-in-difference specification. While the schools in our sample all rank in the top 20 of engineering programs in the United States, we further rank schools based on acceptance rates from *U.S. News and World Report* to capture admissions selectivity and thereby graduate ability. Based on these rankings, described in Table 3, the top 6 schools in our sample are Caltech, CMU, Cornell, MIT, Northwestern, and Stanford.

To construct our second measure of talent, we use hand-collected data on Latin honors received at graduation, from the commencement programs of Caltech, Northwestern, and Stanford, which we supplement with self-reported data on graduation honors from online résumés for the whole sample. We estimate Specification (1) for subsamples based on whether the engineer graduated from a higher-ranked school or received Latin honors at graduation. The coefficient of *MSA Finance Share in* 1990_i captures whether engineers from the most selective schools, or those who received graduation honors, are more likely to switch to finance in *high-finance-growth* areas.

2.4 Moves to Finance and Entrepreneurship

To examine whether engineers are more likely to become entrepreneurs after remaining in engineering or switching to finance, we identify all firms created or co-founded by the engineers in our sample. Additionally, to identify innovative ventures, we collect data on the patents created by the firms founded by the engineers in our sample, and define an innovative firm as a firm with at least one patent. Specifically, we estimate the following linear probability specification with two outcome variables:

$$
\begin{aligned}
\text{Prob. (Innov.) Entrepreneur}_i \quad = \quad & \beta_1 \times \text{Move to Finance}_{00-08} \times \text{MSA Share in Finance}_{i,90} \quad (3) \\
& +\beta_2 \times \text{Move to Finance}_{00-08} \\
& +\beta_3 \times \text{MSA Emp Share in Finance}_{i,1990} \\
& +MSA\ Controls \\
& +\text{School-Graduation year-Major FE} \\
& +\text{Firm-Industry FE} \\
& +\text{Firm- Size FE} + \varepsilon_i,
\end{aligned}
$$

where *Move to Finance*$_{00-08}$ is a dummy variable that equals one if an engineer who graduated between 1998 and 2006 switched from a non-financial sector job to a finance job between 2000 and 2008. The coefficient of *Move to Finance*$_{00-08}\times$ *MSA Share in Finance*$_{i,90}$ measures the likelihood that engineers who take finance jobs in *high-finance-growth* areas become entrepreneurs, and the coefficient of *Move to Finance*$_{00-08}$ captures the average likelihood that engineers located in *low-finance-growth* metros who take finance jobs become entrepreneurs. Note that β_1 estimates the difference between $(y^{high}_{move} - y^{high}_{stay})$ and $(y^{low}_{move} - y^{low}_{stay})$, where the first expression measures the effect of financial sector growth and potential selection into finance, and the second expression captures the selection into finance, so that β_1 captures the causal effect of financial sector growth on the likelihood of becoming an entrepreneur.

3 DATA

3.1 Business Networking Service Data

We obtain our data from a large online business networking service (OBNS) in the United States. This online platform includes 110 million U.S. users, about 60% of the U.S. labor force. Individuals self-report their résumés, which include their educational background and employment history. Users of this website have an incentive to keep their profiles complete and up-to-date since the site is considered an excellent platform for professional networking, and many employers use it as a recruiting tool either by posting job advertisements or through direct headhunting. As a result, the information on education and employment is well populated. Overall, the industry distribution of users reflects the distribution of industries in the U.S., with slight overrepresentation of some industries.[17] Typical education information includes each degree, school, dates attended, and major.[18] Individuals also report whether they received Latin honors at graduation, and we use this information when reported. The history of employment includes the title, full name of the firm, start and end dates, and, in many cases, a detailed job description and location. All users report their current industry and location, and all data is publicly available and obtained through web searches.

The online platform also contains firm profiles, which are typically maintained by the firms. For each firm, we observe the following information: industry category, headquarters' full address, and company size (measured by employment bins). The link between the firm name in the user's résumé and the firm profile is automatically provided by the OBNS in most cases. When the link is not provided, we find the firm profile that matches the exact firm name reported in the user's résumé. Finally, the OBNS has its own industry classification system, composed of approximately 150 industry categories. We manually map each industry category to a 3-digit NAICS code.

3.2 County of Business Patterns

We use data from the Integrated Public Use Microdata Series (IPUMS) to measure financial-sector presence in each metropolitan area. Specifically, we identify the share of college-educated workers employed in two sub-sectors of finance: securities and credit intermediation. The securities industry corresponds to the 3-digit NAICS category 523, which is described as securities, commodity contracts, and other financial investments and related activities. The financial intermediation industry maps to the 3-digit NAICS category 522, which is described as credit intermediation and related activities. To construct our main explanatory variable, *MSA Finance Share in 1990*, we use the number of employees in both sub-industries in each metropolitan area and divide by the total number of college-educated workers in the area.

[17] See Hacamo and Kleiner (2016) for a detailed discussion of the mapping between the distribution of industries in the OBNS and the U.S. economy.

[18] We are able to distinguish between employees with Bachelor's degrees, Master's degrees, MBAs, J.D.s, and PhDs.

3.3 Commencement programs

Our third source of data are the commencement programs published by universities for graduation ceremonies, which we collect from university archives. Commencement programs list the names of graduating students by department and major, and we use this information to identify engineering graduates each year. Additionally, we observe students who graduated with Latin honors, i.e., *cum laude, magna cum laude*, and *summa cum laude.* We use this information to define a measure of talent based on whether a student graduated with honors. We also use data on self-reported Latin honors from online résumés for all schools.

3.4 Construction of the dataset

We start with the top 20 U.S. engineering colleges according to the *US News and World Report* engineering program rankings and select a sample of twelve schools that includes both private and public institutions and provides reasonable geographic coverage across the United States. Our list consists of the following top engineering schools: California Institute of Technology, Carnegie Mellon University, Cornell University, Georgia Institute of Technology, Massachusetts Institute of Technology, Northwestern University, Stanford University, University of California, Berkeley, University of California, Los Angeles, University of Illinois, Urbana-Champaign, University of Texas, Austin, and University of Wisconsin, Madison. Using public information from university websites on graduating class sizes, in Table 3, Panel B we show that our data covers between 93% (MIT) to 99% (Wisconsin) of the graduating cohorts from each school. We find all the users in the OBNS who report having graduated with an engineering degree from these schools between 1998 and 2009.

We identify the industries that these engineers join after graduation from their résumés, and use the locations of those who joined non-financial firms to map them to a metropolitan area. For approximately 30% of the individuals in our sample, we also observe branch location, and for these cases we overwrite the headquarters location with the branch location. Using the metro area identifier, we merge the dataset with the Integrated Public Use Microdata Series. Finally we merge the data with the commencement programs to identify the students who graduated with honors.

4 RESULTS

4.1 Describing metropolitan area characteristics

In Table 1, we present the share of college-educated workers employed in finance in 1990 (*MSA Finance Share 1990)* for the industry overall, as well as separately for the securities and credit intermediation subsectors. We also provide descriptive statistics for *MSA Finance Share 1980,* the share of college-educated workers in the metro area in 1980, the overall share of college-educated workers in all sectors in the metro area, employment growth in the metro area, total employment in the metro area, and employment growth in the non-financial sectors that employ the engineers in our data. From Table 1, we note that finance employment is widely dispersed across metro areas:

on average, 3.1% of college-educated workers are employed in finance firms, while the 25^{th} and 75^{th} percentiles of this variable are equal to 2.3% and 3.9%, respectively. We note that the average size of metro areas, as measured by total employment, is similar across regions.

4.2 Describing engineering majors

From Table 3, Panel A, we observe that about 10% of the engineers in our sample (nearly $7,000$ engineers) choose jobs in finance within five years of graduation. Half of this sample chooses finance jobs at graduation ($3,380$ engineers), while the remaining move from non-financial sector jobs to the financial sector within five years ($3,374$ engineers). In column (3) we also describe job mobility within non-financial sectors by major, and find that on average more than half of the engineers who take jobs in non-financial sectors at graduation, move to other non-financial sector jobs within the first five years of graduation.

Which majors are more likely to move to finance? From Table 3, Panel A, we note that finance attracts engineers from multiple majors, rather just computer science, indicating that the demand for engineers in finance is not simply driven by an increase in information technology jobs. For example, among engineers who take a job in the non-financial sector at graduation and switch to finance within five years of graduation, about 7% are computer science majors, 5% are electrical engineering majors, 5% are mechanical engineering majors, 3% are chemical engineering majors, and 3% are civil engineering majors.

We describe the movement of engineers to finance across graduation cohorts in Appendix Table A1, Panel A, where we observe that the fraction of engineers switching to finance from non-financial sector jobs increased every year until 2008, reaching its peak between 2006 and 2007, and then declined during the financial crisis (column (2)). In contrast, from column (3) we observe that the fraction of engineers who move within non-financial sector jobs increased during every year of our sample, even during the financial crisis. This pattern supports our hypothesis that engineers take finance jobs due to a "pull" from the financial sector rather than a "push" from other sectors.

Which schools send more engineers to finance? In Table 3, Panel B, we describe school rankings from *U.S. News and World Report* based on acceptance rates. From Panel C we note that engineering graduates from the six most selective schools are more likely to choose jobs in the financial services sector. For example, among engineering graduates who choose non-financial sector jobs at graduation, about 6% of engineers from higher-ranked schools move to finance, compared to 4% of engineers from the other schools. In Appendix Table A1, Panel B shows that between 1998 and 2009, the schools that sent the most engineers to finance were Cornell University (about 16% of its graduates, or $1,000$ engineers), Northwestern (14% or 460 engineers), MIT (13% or 753 engineers), Carnegie Mellon (13% or 586 engineers), and Stanford (13% or 541 engineers), which rank among the most selective schools in our data.

Occupations of engineers in finance Table 4 describes the occupations of engineers in financial services firms. We note that the majority of engineers employed in the financial sector do not have IT or engineering-specific jobs in the financial sector. Using data on job titles to identify occupations, in column (2) of Table 4 we show that, on average, about 24% of engineers who move from non-finance jobs to the financial sector are in engineering-specific occupations, while the remaining 76% are in finance-specific occupations such as traders, analysts, vice-presidents, managers, or other non-engineering occupations. For engineers from higher-ranked schools, only 18% are in engineering-specific occupations, while among engineers from other schools, 33% are in engineering-specific occupations.

Focusing on computer science majors, who are most likely to be employed as IT professionals, in Appendix Table A4 Panel A, we observe that about 39% are employed as IT professionals and engineers in financial firms, whereas the rest are employed in non-engineering occupations, such as analysts (21%) or traders/quants (12%). Among non-computer science majors who move to the finance industry from engineering jobs, from column (2) of Appendix Table A4 Panel B we observe that about 9% are employed in IT and engineering occupations in financial firms.

Entrepreneurship among engineers In Table 4, Panel B, we show that on average for the full sample, over 9% of engineers found a firm, of whom about 3% become founders within 5 years of graduation, while 6% found a firm within 10 years of graduation. The summary statistics also suggest that engineers from higher-ranked schools are significantly more likely to become entrepreneurs: about 12% of engineering graduates from higher-ranked schools become entrepreneurs, compared to 8% of engineers from other schools. Lastly, about 1% of all engineers become entrepreneurs with at least one patent, and this likelihood is also higher for engineers from higher-ranked schools.

Which industries lose engineers to finance? Appendix Table A2 describes the distribution of engineering jobs across industries. From Panel A, we observe that at graduation, 35% of engineers choose jobs in the professional services sector, 31% in manufacturing, 15% in education and health, and the rest are distributed across several other sectors. The data also suggest that the movement of engineers to finance is not driven by a "push" from declining manufacturing sectors. For example, from Panel B of Appendix Table A2, we observe that only 3% of engineers employed in manufacturing move to finance within five years of graduation, compared to 6% of those employed in the Professional and Business Services sector.

4.3 Does financial sector growth attract workers from other sectors?

4.3.1 Macroeconomic evidence

Data from the Current Population Survey provides macroeconomic support for our hypothesis that financial sector growth attracts engineers to finance. From Figure 1, we observe that in the 1970s and 1980s, prior to the onset of financial sector growth, there was little movement of engineers to finance.[19] Starting in the mid-1990s, and coinciding with the start of the rapid growth of the financial sector in the U.S., an increasing number of engineers began transitioning from engineering occupations to finance, a trend that persisted until the onset of the 2008 financial crisis. While the movement of engineers to finance fell during the financial crisis, consistent with the view that financial sector growth "pulls" engineers, it rebounded and surpassed pre-crisis levels by 2015, suggesting that the influx of engineers into finance is an ongoing trend.

4.3.2 Baseline Specification

To investigate whether financial sector growth leads engineers from other sectors to take financial sector jobs, we examine whether the probability of these engineers taking a job in the financial sector varies based on the growth of financial sector firms in the metro area where the engineer works. We start by estimating the linear probability model in Specification (1), described in Section 2.1, using individual-level data on engineers who graduated between 1998 and 2006 from 12 public and private universities around the country, and whose first job after graduation is in the non-financial sector. The dependent variable is the probability that an engineer takes a job in the financial services industry between 2000 and 2008, and the variable of interest is *MSA Finance Share 1990*, which measures the share of college-educated employees in the financial services sector in 1990 in the metro area where the engineer is employed in the non-financial sector.

Table 6 reports the estimation of different variations of Specification (1). To examine the stability of our estimates, we start with a simplified specification without control variables in column (1), and add covariates until we obtain the complete specification. To this end, column (1) reports a model with *MSA Finance Share 1990* and a 3-digit NAICS fixed effect, column (2) adds all the MSA-level controls, a fixed effect for firm size class, and school, major, and graduation year fixed effects. The specification in column (3) adds a fixed effect for the interaction of school-year-major, thereby only comparing engineers who are classmates. Columns (4) and (5) consider the shares of college-educated workers employed in two subsectors of finance, securities and credit intermediation; we control for school, major, and graduation year fixed effects in column (4) and the interacted fixed effect of school-year-major in column (5). We use the share of college-educated workers employed in finance in a MSA in 1980 in column (6), where we control for MSA size and industry fixed effects. Lastly, in column (7) we include all MSA controls and school-year-major fixed effects.

From the results reported in columns (1)-(3) of Table 6, we note that the size of the estimated coefficients remains stable across specifications. Economically, these results suggest that there is a greater likelihood that an engineer will move from a job in the non-financial sector to the financial sector if she works in a MSA with a higher share of financial-sector employment. For example, from column (3) we note that relative to the sample mean likelihood of moving to finance of 5%, an engineer located in a *high-finance-growth* metro area (75^{th} percentile of finance employment share)

[19] Note that the CPS data includes engineers in all career stages and age groups. The fraction of annual moves to finance would be higher if the sample were restricted to recent graduates, as in our data.

is 31% more likely to move to finance from a different sector compared to an engineer working in a *low-finance-growth* metro area (25^{th} percentile of finance employment share).

Considering the securities and credit intermediation subsectors separately, we show in columns (4) and (5) that the estimated coefficients of the metro-area employment shares in these subsectors are positive and statistically significant across all specifications, but the "pull" from finance is stronger when the MSA has a greater share of employment in securities firms, which is consistent with the fact that securities industry jobs are more highly compensated than jobs in credit intermediation. From the results reported in column (5) we note that, compared to an engineer working in a *low-finance-growth* metro, an engineer with the same major, school, and graduation year working in a *high-finance-growth* metro is 22% more likely to move to a position in the financial sector relative to the mean. The analogous difference is only 8% for transitions to the credit intermediation industry. Note that these results indicate that moves to the securities industry accounts for two-thirds of all engineer moves to finance, while moves to credit intermediation accounts for the remaining one-third.

Philippon and Reshef (2012), among others, have noted that the financial sector became more skill-intensive starting in the early 1990s. In columns (6) and (7) of Table 6, we use the alternative explanatory variable, *MSA Finance Share in 1980,* which captures the presence of financial sector firms in a metro area several years prior to the industry's expansion. We observe effects of similar magnitude and significance to the baseline results.

4.3.3 Within Firm Analysis

We describe the results from a firm-level fixed effects specification where we compare engineers who work in branches of the same firm that are located in different metropolitan areas. In Table 7 we show that the estimated coefficients of the share of financial-sector employment are positive and statistically significant in columns (1) - (3), where we include firm-level fixed effects in addition to school, year of graduation, and major fixed effects in column (2), and school-year-major fixed effects in column (3). In columns (4)-(7), we consider the employment share in securities and credit intermediation firms in a metro area. Due to the smaller sample size, the estimated coefficients of metro-area employment share are lower in magnitude when comparing individuals who work in different branches of the same firm compared to Table 6, but remain positive and statistically significant across all the specifications.

The firm-level fixed effects results indicate that our baseline results are not driven by individuals being "pushed" from declining firms within an industry. Moreover, if firms allocate young employees to branches according to the needs of the firm rather than the preferences of the worker, this specification may also address self-selection by engineers into metro areas based on a preference for financial sector jobs

4.3.4 Excluding major financial centers

We conduct subsample tests in which we exclude the major financial centers of New York (including adjacent localities in New Jersey), Chicago, and the Bridgeport-Stamford-Norwalk metro area in Connecticut. The results reported in Table 8 show that the estimated coefficients of MSA employment share in finance in 1990 for the subsamples excluding major financial centers (columns (3)-(6)) are similar to those for the full sample (columns (1) and (2)). The economic magnitudes are also similar to those for the full sample. Our results are not driven by the self-selection of engineers into non-financial sector jobs located in major financial centers.

4.3.5 Examining switches over time

In Table 9, we estimate Specification (1) over different time periods to capture peak and non-peak financial growth, using data on engineering cohorts that graduated up to two years prior to the beginning of each period. The results suggest that a significantly larger fraction of engineers moved to finance during the peak years of financial sector growth (2006 to 2007) than during the non-peak period (2000 to 2001). Regarding the magnitude of the effects, the results in column (3) of Table 9 show that relative to the mean, an engineer located in a *high-finance-growth* metro is 1.2 times more likely to switch to finance compared to an engineer located in a *low-finance-growth* metro. The differential effects across time corroborate our hypothesis that financial sector growth leads engineers to switch to financial sector jobs, and indicate that our results are robust to controlling for fixed industrial characteristics across regions.

4.3.6 Alternative hometown location

We use hand-collected data from the commencement programs of two top schools, Stanford and Caltech, to identify the metro-area locations of engineering graduates' hometowns, and investigate whether the presence of finance employment in an individual's hometown affects the likelihood that the engineer will switch to finance from a non-financial sector job.

The results are reported in Table 10. We note from columns (1)-(3) that, despite the smaller sample size, the estimated coefficients are similar in magnitude and statistical significance to the baseline results in Table 6. From the results reported in column (3), we observe that, compared to an engineer who grew up in a *low-finance-growth* metro, an engineer with the same major, school, and year who grew up in a *high-finance-growth* metro is 18% more likely to move to a position in the financial sector, relative to the mean. Therefore, our baseline results are robust to using this alternative definition of location, which is not affected by engineers choosing to locate in metro areas with high financial sector presence.

4.4 Does financial sector growth attract more talented workers?

Our results suggest that the financial sector competes for skilled engineers with other sectors, but it may be the case that those who switch to careers in finance are not the most talented engineers.

Specifically, we rank schools based on their acceptance rates (ranging from 5% for Stanford to 59% for Illinois, as reported in Table 3, Panel B), and using data on graduation honors, investigate whether engineers who graduate from the six most selective schools, and those that receive honors, are more likely to switch to finance.[20]

From the results reported in Table 11, we note that the likelihood of switching to finance is three times higher for those who graduate from the more selective schools. For example, relative to the sample means, working in a *high-finance-growth* metro area raises the likelihood of moving to the financial sector by 41% for a graduate of a more selective engineering school, compared to 21% for a graduate of a less selective engineering school.

To capture skill-heterogeneity within schools we use hand-collected data from commencement programs and self-reported data from online résumés on graduation honors for the engineers in our sample. From Table 5 we observe that the fraction of engineers who move to finance at graduation and receive honors in college ranges from 9% to 15% for the commencement sample. Considering engineers who move to finance within 5 years of graduation, we note that for all three schools, the fraction of engineers with honors who move to finance is greater than the fraction of engineers with honors who stay in the non-financial sector (columns (3) and (4)). The pattern is similar for the full sample of engineers using self-reported data on honors.

In Table 12, we find that the estimated coefficient of *MSA Share in Finance* is statistically significant in columns (1) and (2) for the commencement programs sample, controlling for industry fixed effects and metro area employment. For example, from column (2) we note that relative to the sample mean, an engineer who graduated with honors and works in a *high-finance-growth* metro is 90% more likely to switch to a finance job, compared to her classmate who works in a *low-finance-growth* metro. The results in columns (3) and (4) suggest that graduates from these three top-ranked schools who did not receive honors are not more likely to move to finance.

We also use data on honors awards reported by individuals in the online networking database and describe the results in columns (5)-(8) of Table 12. We find that both engineers who received honors and those who did not are significantly likely to switch to finance in areas with greater financial-sector presence, but the likelihood is higher for those who graduated with honors. For example, relative to the sample mean likelihood of moving to finance of 5%, an engineer who graduated with honors and works in a *high-finance-growth* metro is 52% more likely to switch to finance compared to her classmate who works in a *low-finance-growth* metro (column (6)). This difference falls to 30% for engineers who did not graduate with honors (column (8)).

4.5 Does financial sector growth lead to an education-occupation mismatch?

If talented engineers move to financial sector firms, they risk losing the specialized human capital arising from their education and work experience, which may affect their likelihood of becoming an entrepreneur. Alternatively, talented engineers may be employed in engineering occupations in

[20] The results are similar if we rank schools according to their overall national reputation, as reported by *U.S. News and World Report*, or by the high school GPA of incoming students.

finance, allowing them to retain their engineering skills. We use job titles to classify the occupations of engineers who move to the financial sector into two categories: *Engineering* occupations (eg., software and network engineering), and *Finance-specific* occupations (i.e., Trader, Portfolio Manager, Analyst, Investment Banker), which do not necessarily require an engineering education. This approach assumes that engineers do not use their engineering knowledge in finance occupations, and conversely, that engineers in *Engineering-specific* occupations in finance do retain their engineering knowledge, even though the roles may also include finance-specific tasks.

Recall from Table 4 that the majority of engineers who move to the financial sector from other sectors move into finance-specific rather than engineering-specific occupations in the financial sector, and that among engineers from highly ranked schools, only 18% work *Engineering-specific* occupations, while 82% work in *Finance-specific* occupations.

In Table 13, we report the results from estimating the baseline model for four subsamples constructed from combining the two occupation groups, *Engineering* and *Finance-specific*, and two school categories, higher-ranked and other schools. The estimates show that an engineer from a higher-ranked school working in a high-growth finance metro is 1.58 percentage points more likely to move to a *Finance-specific* occupation than one working in a *low-finance-growth* metro. This difference between engineers in *high-* and *low-finance-growth* metros drops to 0.53 percentage points when we compare engineers from less selective schools. When analyzing moves to *Engineering-specific* occupations, these differences are 1.33 percentage points for engineers from a higher-ranked school and 0.40 percentage points for engineers from less selective schools, respectively. Our results show that financial sector growth leads to a large share of engineers working in occupations that do not require engineering skills.

4.6 Does an early career move to finance affect the likelihood of becoming an entrepreneur in the long-run?

We examine whether engineers are more likely to become entrepreneurs based on whether they switch to finance early in their career. In particular, it may be the case that engineers who work in finance gain preferential access to financing, which may increase the likelihood that they subsequently become entrepreneurs. Alternatively, switching to a finance job may result in a loss of human capital that is important for innovation, or high finance wages may act as a disincentive to engage in risky entrepreneurship.

The results from Specification (3) are reported in Table 14. In columns (1) and (2) we consider all firms that were founded or co-founded by the engineers in our sample, and in the remaining columns we focus on innovative entrepreneurs only. From columns (1) and (2) of Table 14, we note that, on average, engineers from all schools who move to financial sector jobs in *high-finance-growth* metros are significantly less likely to subsequently become entrepreneurs compared to their classmates. For example, from column (2) we note that relative to the sample mean, an engineer who works in a *high-finance-growth* metro is nearly 20% less likely to become an entrepreneur compared to her classmate in a *low-finance-growth* metro. These results compare engineers with the same school-year-major, and the coefficient magnitude is similar when we control for metro-area characteristics.

The positive and statistically significant coefficient of the *Move to Finance* variable in Table 14 suggests that engineers who move to finance jobs from *low-finance-growth* metro areas are significantly more likely to become entrepreneurs. This result may capture the self-selection of engineers into financial sector jobs in *low-finance-growth* metros, who may switch to finance to gain preferential access to capital for their entrepreneurial ventures. In contrast, engineers who are "pulled" by the financial sector do not appear to take advantage of the preferential access to capital.

In columns (3)-(6) of Table 14, we consider the likelihood that an engineer becomes an entrepreneur of an innovative firm (with at least one patent) based on their early-career decision to switch to the financial sector or remain in engineering. The results in column (3) show that engineers who move to finance from *high-growth-metros* are significantly less likely to become founders or co-founders of a firm with at least one patent, compared to their classmates who did not switch to financial sector jobs. From columns (5) and (6) we observe that this result is driven by engineers from top-ranked schools. Specifically, the results suggest that engineers from top-ranked schools who move to financial sector jobs in *high-finance-growth* areas are significantly less likely to become innovative entrepreneurs compared to their classmates from the same school, major, and graduation year. Note that these results are equivalent to a triple difference estimate. In column (4) of Table 14, we restrict the sample to entrepreneurs who founded a firm more than 2 years after graduation, to avoid capturing individuals who become entrepreneurs directly after graduation and who may differ from their classmates in their career outcomes. The results are unchanged.

Our findings suggest that elite engineers who are attracted to finance jobs due to financial sector growth are significantly less likely to subsequently become entrepreneurs, or innovative entrepreneurs, compared to their classmates who do not switch to finance due to financial sector growth. Given the previous finding that highly talented engineers are more likely to be employed in finance-specific occupations that do not require engineering skills, these results are consistent with the view that talented engineers who move to finance due to financial sector growth, may fail to develop entrepreneurial ideas because their engineering skills depreciate in the financial sector.

4.6.1 Hometown location and entrepreneurship

We also investigate whether the decision to become an innovative entrepreneur varies based on engineers' hometown location. The advantage of this measure is that engineers are less likely to choose their hometowns. Specifically, we estimate Specification (3) using the hometown MSA location of engineers and report the results in Table 15.

From the results reported in columns (1) and (2), we note that, on average, engineers who grew up in *high-finance-growth* areas and switch to financial sector jobs are significantly less likely to subsequently become entrepreneurs compared to their classmates. These results compare engineers with the same school-major-graduation year. The results in column (3) show that engineers who grew up in a hometown with a high financial sector presence and move from engineering to financial sector jobs are significantly less likely to become founders or co-founders of a firm with at least one patent, compared to their classmates who did not switch to the financial sector. In column (4), we restrict the sample to entrepreneurs who found a firm more than 2 years after graduation, and observe similar results.

5 ROBUSTNESS TESTS

5.1 Do engineers move from the (declining) manufacturing sector?

To further examine whether engineers move because of a "push" from declining firms or industries rather than being "pulled" by financial sector growth, we investigate whether engineers are more likely to move to the financial sector from manufacturing, given the decline of this industry during our sample period (Pierce and Schott 2016). Note from the summary statistics in Table 2, Panel A that upon graduation, 31% and 35% of engineers entered manufacturing and professional services industries, and 3% and 6% of engineers from these two industries respectively moved to financial sector jobs within five years of graduation.

In Appendix Table A5, we report the results from estimating Specification (1) for subsamples of manufacturing and professional services firms. The results show that the likelihood of moving to finance jobs is significantly higher for engineers who work in firms in the professional services sector located in a *high-finance-growth* metro, compared to engineers holding similar jobs in a *low-finance-growth* metro. However, there is no significant difference in this likelihood for engineers employed in manufacturing firms in *high-* versus *low-finance-growth* areas. Thus, our results do not appear to be driven by declining growth in the manufacturing industry.

5.2 Do engineers switch sectors because of an increase in information technology jobs?

The movement of engineers to the financial sector may be driven both by higher wages and an increase in information technology jobs in financial firms. While in either case the movement is driven by a "pull" from finance, it is useful to examine the type of majors hired by financial firms, and in particular, determine whether engineers are mainly hired into technology jobs. In Appendix Table A6, we examine the likelihood of moving to finance for subsamples of engineers constructed based on their majors. The results show that civil, computer, electrical, mechanical, and chemical engineering majors are all significantly likely to move to finance if they work in a *high-finance-growth* metro. This indicates that the movement of engineers to finance jobs is not simply driven by increased information technology positions, which would imply increased demand mostly for computer science majors. Moreover, as reported previously, about 76% of engineers who switch to finance are employed in finance-specific occupations, while 26% are employed in engineering-specific occupations in the financial sector.

5.3 Does the finance industry attract workers after the financial crisis?

Our baseline results are for the years 1998 to 2006, which does not include the 2008 financial crisis and subsequent years. To examine whether financial sector growth is associated with the movement of engineers to finance jobs during the financial crisis years and beyond, we extend our analysis to study whether engineers moved to finance jobs in two different time windows, between 2008 and 2010 and between 2011 and 2016, which capture the crisis and post-crisis years, respectively. We use the MSA share of college-educated workers employed in the credit intermediation sub-sector in 1990 as our main explanatory variable to capture the fact that the financial crisis primarily affected this sub-sector.

In estimating specification (1) for these different periods, two patterns emerge. First, the results in Appendix Table A7 show that the probability of switching to the financial sector is positively and significantly associated with the 1990 share of credit intermediation employment in the engineer's MSA during the crisis, but the effects are smaller in magnitude compared to Table 6, reflecting shrinking labor demand in the banking sector during the 2008 financial crisis. This result provides additional corroboration that financial sector growth attracts talented workers from other sectors, since the movement declines with declining financial sector growth. Second, columns (3) and (4) show that the estimated coefficient of MSA share of employment in credit intermediation increases in magnitude between 2011 and 2016, and is larger compared to the baseline results in Table 6. This result suggests that the movement of skilled workers to the finance industry resumed after the financial crisis and remains an ongoing trend.

5.4 Are the results explained by moves from management consulting to finance?

Since an engineer in the management consulting sector also uses a small fraction of her engineering skill set, an initial move to this sector at graduation may reflect individual preferences to opt out of engineering-related jobs. Therefore, we investigate whether our results are driven by engineers who move to finance from management consulting jobs. We construct a sample that excludes any engineer employed in the management consulting sector following graduation (which includes firms such as McKinsey & Company and Boston Consulting Group), and estimate Specification (1) for this sub-sample. From Appendix Table A9 we note that our previous results are mostly unchanged when we exclude transitions from management consulting to finance.

5.5 Are more skilled engineers more likely to move in general?

Our results may alternatively be explained by the higher mobility of superstar workers. To investigate, we test whether in *high-finance-growth* metro areas, elite engineers are more likely to move to any growing industry, not just finance. Engineers who move may be more talented and therefore more likely to be poached by any firm that aims to acquire talent. Since management consulting is another industry that has historically employed talented engineers, we test whether engineers are more likely to transition to management consulting in metro areas where the share of financial-sector employment is larger. Using the subsample of engineers who are employed in non-financial and non-consulting sectors, we estimate Specification (1) by changing the outcome variable to the transition to management consulting instead of finance. The results reported in Appendix Table A9 show that the probability that engineers move to management consulting in areas with a large financial-sector presence is statistically and economically equal to zero. Therefore, our results are not simply explained by talented engineers' higher propensity to switch industries.

5.6 Double major engineers

Engineers who move to finance jobs may be double majors in business, finance or related fields, which may reflect an early preference for a finance rather than an engineering career. To investigate, we collect data on whether the engineers in our sample have a double major in business administration, economics, or finance and examine the likelihood of these engineers moving to finance jobs. In Table A10, we report the results for the full sample (column (1)), the subsample of engineers with a single major (column (2)), and the subsample of engineers with a double major (column (3)). As the results indicate, engineers with a double major are not significantly more likely to switch to finance in *high-finance-growth* metros (column (3)), whereas the results for single-major engineers are similar to those for the full sample (column (2)).

6 CONCLUSION

To the best of our knowledge, we are the first to show that financial sector growth attracts highly talented workers from other fields. Specifically, we observe that engineers with the potential to be superstars, such as those who attend the most selective schools and/or earn graduation honors, are significantly more likely to switch to the finance industry from non-financial sector jobs in metro areas that experience high financial sector growth. This result provides a potential explanation for the wage premium for skilled finance workers documented in recent work by Philippon and Reshef (2012), and suggests that high wages in the financial sector may be driven by competition for scarce talent with the rest of the economy.

Using granular occupational data, we find that the majority of engineers who move to finance jobs are employed in finance-specific occupations, such as traders and analysts, rather than engineering-specific occupations, such as IT or network engineers. This education-occupation mismatch suggests that skilled engineers may not use their engineering skills in financial sector jobs.

We are the first to examine the long-run career impact of switching to the financial services sector for individuals who have the potential to be superstars in their field. Compared to their classmates, engineers from top schools who switch to finance jobs due to financial sector growth are significantly less likely to found their own firms, or become innovative entrepreneurs, suggesting that talented engineers who switch to the financial sector may not develop entrepreneurial ideas because they lose their engineering skills.

References

Acs, Z., T. Astebro, D. Audretsch, and T. Robinson David (2016). "Public policy to promote entrepreneurship: A call to arms". *Small Business Economics* 47.1, pp. 35–51.

Adelino, M., A. Schoar, and F. Severino (2015). "House prices, collateral, and self-employment". *Journal of Financial Economics* 117.2, pp. 288–306.

Altonji, J. G., E. Blom, and C. Meghir (2012). "Heterogeneity in human capital investments: High school curriculum, college major, and careers". *Annual Review of Economics* 4.1, pp. 185–223.

Altonji, J. G., L. B. Kahn, and J. D. Speer (2016). "Cashier or consultant? Entry labor market conditions, field of study, and career success". *Journal of Labor Economics* 34.S1, S361–S401.

Axelson, U. and P. Bond (2015). "Wall street occupations". *The Journal of Finance* 70.5, pp. 1949–1996.

Azoulay, P., J. Graff Zivin, and J. Wang (2010). "Superstar Extinction". *The Quarterly Journal of Economics* 125.2, pp. 549–589.

Babina, T., P. Ouimet, and R. Zarutskie (2016). "Going entrepreneurial? IPOs and new firm creation". *Working Paper.*

Bartik, T. J. (1991). *Who Benefits from State and Local Economic Development Policies?* Books from Upjohn Press. W.E. Upjohn Institute for Employment Research.

Baumol, W., M. Schilling, and E. Wolff (2009). "The Superstar Inventors and Entrepreneurs: How Were They Educated?" *Journal of Economics & Management Strategy* 18.3, pp. 711–728.

Bell, B. and J. Van Reenen (2013). "Extreme wage inequality: Pay at the very top". *The American Economic Review* 103.3, pp. 153–157.

— (2014). "Bankers and their Bonuses". *The Economic Journal* 124.574, F1–F21.

Benabou, R. and J. Tirole (2016). "Bonus culture, competitive pay, screening, and multitasking". *Journal of Political Economy* 124.2, pp. 305–370.

Böhm, M., D. Metzger, and P. Strömberg (2016). ""Since You're So Rich, You Must Be Really Smart": Talent and the Finance Wage Premium". *Working Paper.*

Bond, P. and V. Glode (2014). "The labor market for bankers and regulators". *Review of Financial Studies* 27, pp. 2539–2579.

Boustanifar, H., E. Grant, and A. Reshef (2017). "Wages and Human Capital in Finance: International Evidence, 1970–2011". *Review of Finance.*

Bureau of Labor Statistics (2015). *STEM crisis or STEM surplus? Yes and yes.* Tech. rep.

Card, D. (1992). "Using Regional Variation in Wages to Measure the Effects of the Federal Minimum Wage". *Industrial & Labor Relations Review* 46.1, pp. 22–37.

Carnevale, A., B. Cheah, and A. Hanson (2015). *The economic value of college majors.* Tech. rep. Center on Education and the Workforce, McCourt School of Public Policy, Georgetown University.

Célérier, C. and B. Vallée (2017). "Returns to talent and the finance wage premium". *Working Paper.*

Engelberg, J., P. Gao, and C. Parsons (2012). "Friends with money". *Journal of Financial Economics* 103.1, pp. 169–188.

Glode, V. and R. Lowery (2015). "Compensating Financial Experts". *The Journal of Finance* 67.6, pp. 2781–2808.

Greenwood, R. and D. Scharfstein (2013). "The growth of finance". *The Journal of Economic Perspectives* 27.2, pp. 3–28.

Guiso, L., P. Sapienza, and L. Zingales (2004). "Does local financial development matter?" *Quarterly Journal of Economics* 119.3, pp. 929–969.

Hacamo, I. and K. Kleiner (2016). "Finding Success in Tragedy: Forced Entrepreneurs after Corporate Bankruptcy". *Working Paper*.

Hoekstra, M. (2009). "The effect of attending the flagship state university on earnings: A discontinuity-based approach". *Review of Economics and Statistics* 91.4, pp. 717–724.

Kahn, L. B. (2010). "The long-term labor market consequences of graduating from college in a bad economy". *Labour Economics* 17.2, pp. 303–316.

Kaplan, S. and J. Rauh (2010). "Wall Street and Main Street: What contributes to the rise in the highest incomes?" *Review of Financial Studies* 23.3, pp. 1004–1050.

Kedrosky, P. and D. Stangler (2011). *Financialization and Its Entrepreneurial Consequences*. Tech. rep. Kauffman Foundation Research Series.

Khoo, P. and B. Ost (2017). "The effect of latin honors on earnings". *Working paper*.

Malmendier, U. and G. Tate (2009). "Superstar CEOs". *The Quarterly Journal of Economics* 124.4, pp. 1593–1638.

Oyer, P. (2008). "The making of an investment banker: Stock market shocks, career choice, and lifetime income". *The Journal of Finance* 63.6, pp. 2601–2628.

Petersen, M. and R. Rajan (1994). "The Benefits of Lending Relationships: Evidence from Small Business Data". *The Journal of Finance* 49.1, pp. 3–37.

Philippon, T. (2015). "Has the US Finance Industry Become Less Efficient? On the Theory and Measurement of Financial Intermediation". *American Economic Review* 105.4, pp. 1408–38.

Philippon, T. and A. Reshef (2012). "Wages and human capital in the US finance industry: 1909–2006". *The Quarterly Journal of Economics* 127.4, pp. 1551–1609.

Pierce, J. and P. Schott (2016). "The surprisingly swift decline of US manufacturing employment". *The American Economic Review* 106.7, pp. 1632–1662.

President's Council of Advisors on Science and Technology (2012). *Engage to excel: Producing one million additional college graduates with degrees in science, technology, engineering, and mathematics*. Tech. rep.

Ransom, M. and A. Phipps (2016). "The changing occupational distribution by college major". *working paper*.

Robst, J. (2007). "Education and job match: The relatedness of college major and work". *Economics of Education Review* 4, pp. 397–407.

Schoar, A. and L. Zuo (2017). “Shaped by booms and busts: How the economy impacts CEO careers and management styles”. *The Review of Financial Studies* 30.5, pp. 1425–1456.

Shu, P. (2016). “Are the “Best and Brightest” Going into Finance? Skill development and career choice of MIT graduates”. *Working Paper*.

Walsh, J. and S. Nagaoka (2009). “Who invents? Evidence from the Japan & US inventor survey”. *RIETI Discussion papers*.

Figure 1: Transitions of Engineers to Finance: Evidence from CPS

Using data from the Current Population Survey (CPS), this figure describes the fraction of U.S. engineers who moved to the financial industry from other sectors in the last 30 years. Each datapoint in the graph represents the likelihood that an engineer moves to the financial industry in that year or the following 5 years. We report the likelihood of moving to finance over a period of 5 years to help the comparison with the statistics presented in Table 3. We identify engineers in the CPS database as individuals who have a college degree and work in engineering occupations, such as industrial engineers, mechanical engineers, or petroleum, mining, and geological engineers, among others.

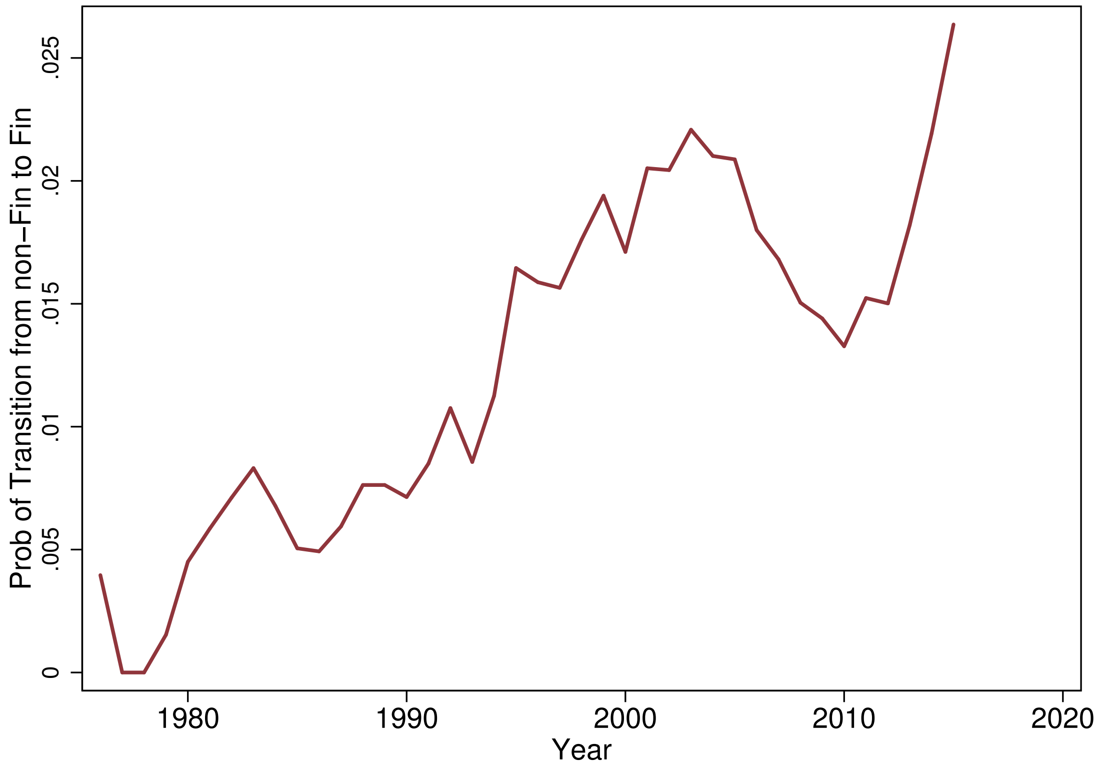

Figure 2: MSA Finance Share in 1990 by Metro Area

The map depicts the share of college educated employment in the financial sector in 1990. We use the decennial census to estimate these shares. Financial sector includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Each bubble is mapped to a MSA and is proportional to the respective employment share. The legend is expressed in decimal points.

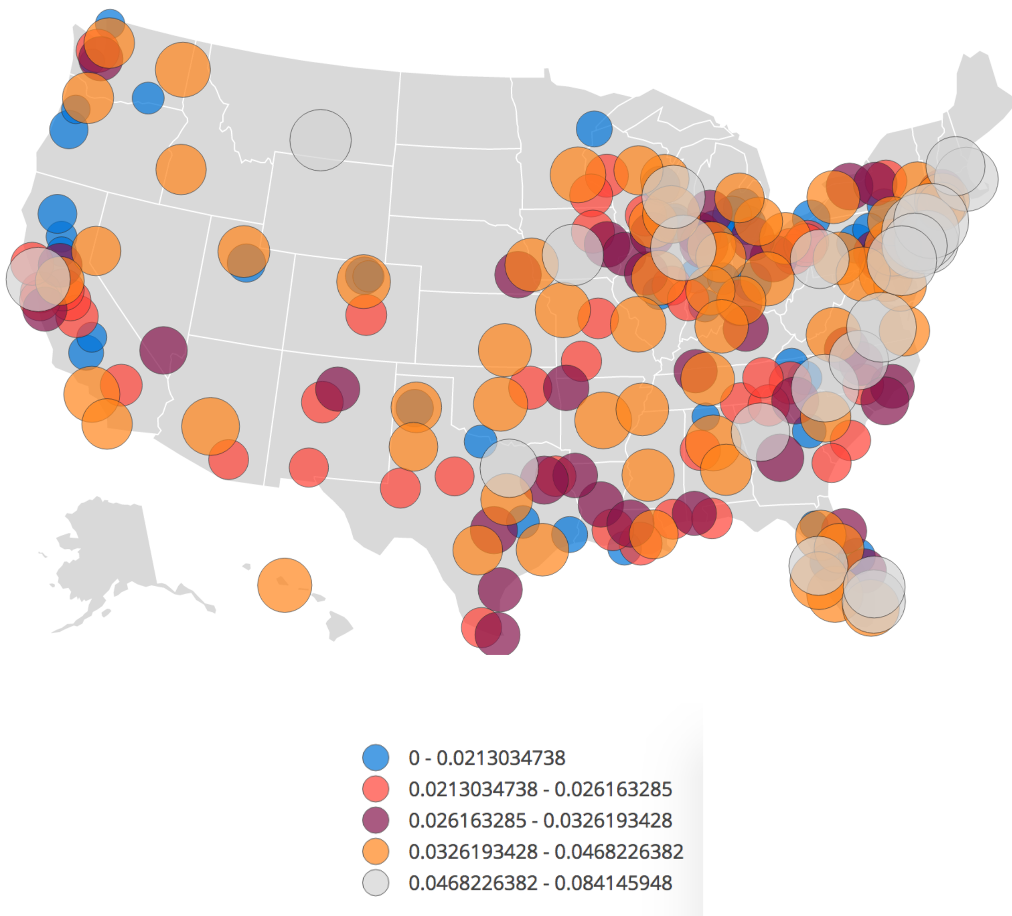

Table 1: Describing Metro-area Industry Characteristics

The table below reports the summary statistics for the metropolitan-level variables used in our regressions.

	N	Mean	Std	10th	25th	75th	90th
MSA Finance Share 1990	210	0.031	0.013	0.016	0.023	0.039	0.047
MSA Finance Share 1990: Securities	206	0.0090	0.0056	0.0037	0.0052	0.011	0.015
MSA Finance Share 1990: Credit Interme.	210	0.022	0.0090	0.012	0.016	0.028	0.033
MSA Finance Share 1980	196	0.025	0.0089	0.015	0.019	0.030	0.036
Share of Workers w/ College in MSA	210	0.25	0.070	0.16	0.20	0.29	0.34
Emp Growth in MSA	208	0.052	0.12	-0.066	-0.021	0.12	0.20
Log (Total Emp in MSA)	210	12.4	1.15	11.1	11.5	13.0	13.9
MSA Growth in Emp in Industry of Eng i	210	0.042	0.51	-0.31	-0.088	0.086	0.33

Table 2: Exogeneity of MSA Finance Share in 1990

Panel A reports the correlation between *MSA Finance Share in 1990* and several measures of employment changes between 2000 and 2006. The correlations are estimated using the following linear probability regression model:

$$\begin{aligned} \text{Change in Employment Share}_{2000\rightarrow2006} &= \beta_1 \times \text{MSA Finance Share}_{1990} \\ &+ \text{Log(Total Emp in MSA)}_{2000} \\ &+ \varepsilon_i \end{aligned}$$

Panel B investigates the likelihood that elite engineers sort into areas with more presence of finance. To this end, it reports the correlations between *MSA Finance Share in 1990* and the likelihood that an engineer graduated from a top-ranked school, received honors at graduation, and founded an innovative firm in the long-run (a firm that generated at least one patent). The correlations are estimated using a regression model similar to the one used in Panel A, where the unit of observation is an engineer. We use the location of the first job to assign an engineer to an MSA. All errors are robust and clustered at the metropolitan level.

Panel A: Does the Share of Finance Employment Predict Future Financial Sector Growth?

	Change in Employment Share (2000→2006)			Emp Growth ('00→'06)
	(1)	(2)	(3)	(4)
	Finance	Manufacturing	Prof. & Services	All
MSA Finance Share 1990	0.147**	-0.040	-0.035	-0.455
	(2.47)	(-0.38)	(-0.23)	(-0.79)
Log (Total Emp in MSA)	0.000	-0.003**	0.004**	0.016**
	(0.12)	(-2.14)	(2.50)	(2.41)
#MSAs	238	238	238	238
R-squared	0.037	0.033	0.033	0.026

Panel B: Does the Share of Finance Employment Predict Sorting of Elite Engineers?

	Higher-ranked	Honors	Innovative Entrepreneur
	(1)	(2)	(3)
MSA Finance Share 1990	2.377	0.121	-0.124
	(0.88)	(0.74)	(-0.84)
Log (Total Emp in MSA)	0.027	-0.001	0.002
	(1.09)	(-0.43)	(1.49)
#Engineers	46261	46261	46261
R-squared	0.027	0.000	0.000

Table 3: Moves to Finance by Major, and School Rank

Panel A describes employment statistics by major. Specifically, column (1) reports the fraction of engineers that entered the finance industry at graduation; column (2) describes the fraction of engineers that moved to the financial sector within 5 years of graduation, after taking a job in the non-financial sector; and column (3) reports the fraction of engineers who switched jobs within 5 years of graduation within the non-financial sector. In columns (1) and (2), *#Engineers* is the total number of engineers by major, and *% Move* is the fraction of total of engineers in that category who moved to another job in the financial sector; in column (3), *% Move* is the fraction of the total of engineers who moved to another job in the non-financial sector. The count of engineers in columns (2) and (3) is smaller than the count in column (1) because it excludes the engineers who started off in the finance industry. Panel B reports the university-wide acceptance rates for each engineering school in our sample. This information is collected from the undergraduate admissions office of each university. Panel B also reports the coverage by school. We estimated the coverage ratios by using the number of graduates reported by the undergraduate programs of each school. Panel C reports similar summary statistics to Panel A but aggregates schools in two groups: top-6 (higher-ranked) and non-top 6 (other schools), based on the acceptance rates from Panel B.

Panel A: Majors

	(1)		(2)		(3)	
	Finance out of College		Move to Finance (≤5y)		Move to Eng (≤5y)	
	#Engineers	% Move	#Engineers	% Move	#Engineers	% Move
Civil Eng	7473	1.82	7337	2.58	7337	55.23
Computer Science Eng	24830	7.39	22994	6.87	22994	55.16
Electrical Eng	7381	3.35	7134	4.82	7134	52.34
Mechanical Eng	15773	4.41	15078	4.60	15078	54.70
Chemical Eng	10298	2.08	10084	3.40	10084	55.05
Other	3797	6.69	3543	5.70	3543	51.74
Total	69552	4.86	66170	5.06	66170	54.56

Panel B: School Ranking by Acceptance Rate

School	Acceptance Rate	Rank	Coverage on Linkedin
Stanford University	4.8%	1	96%
Massachusetts Institute of Technology	7.9%	2	93%
California Institute of Technology	8%	3	94%
Northwestern University	10.7%	4	95%
Carnegie Mellon University	13.7%	5	97%
Cornell University	14%	6	98%
University of California, Berkeley	17.5%	7	95%
University of California, Los Angeles	18%	8	94%
Georgia Institute of Technology	25%	9	93%
University of Texas, Austin	39%	10	97%
University of Wisconsin, Madison	49%	11	99%
University of Illinois, Urbana-Champaign	59%	12	98%

Panel C: School Rank

	(1)		(2)		(3)	
	Finance out of College		Move to Finance (≤5y)		Move to Eng (≤5y)	
	Total #Engineers	% Move	Total #Engineers	% Move	Total #Engineers	% Move
Other Schools	44737	3.18	43314	4.40	43314	54.68
Higher-ranked Schools	24815	7.89	22856	6.32	22856	54.34

Table 4: Careers in Finance and Engineering

This table presents the types of jobs that engineers take when they move to the financial sector. Panel A reports this information for the whole sample of engineers who moved to the financial sector. Types of jobs are identified using the occupation titles reported in the resumes.

Panel A: Jobs of Engineers in the Finance Industry

	(1) All Engineers Finance at Graduation		(2) All Engineers Move Finance (≤5y)		(3) Higher-ranked Move Finance (≤5y)		(4) Other schools Move Finance (≤5y)	
	#Eng	Fraction	#Eng	Fraction	#Eng	Fraction	#Eng	Fraction
Engineering Occupations	832	24.60	868	25.91	359	18.33	473	33.23
IT/Software	758	22.41	772	23.04	331	16.90	427	30.00
Engineer	74	2.19	96	2.87	28	1.43	46	3.23
Finance Occupations	2170	64.16	2022	60.36	1445	73.76	725	50.94
Trader/Quant/Port. Mana.	719	21.26	620	18.51	484	24.71	235	16.51
Analyst/Associate/IB	1136	33.59	914	27.28	782	39.92	354	24.88
VP/President	111	3.28	165	4.93	81	4.13	30	2.11
Manager/Partner	204	6.03	323	9.64	98	5.00	106	7.44
Intern	77	2.28	99	2.96	35	1.79	42	2.95
Other	303	8.96	361	10.78	120	6.12	183	12.86
Total	3382	100.00	3350	100.00	1959	100.00	1423	100.00

Panel B: Entrepreneurial Propensity by School Rank

	Higher-ranked		Other Schools		Total	
	# Engineers	(%)	# Engineers	(%)	# Engineers	(%)
Founder (5 years after grad)	24815	3.59	44737	2.39	69552	2.82
Founder (10 years after grad)	24815	7.21	44737	4.54	69552	5.49
Founder (All years)	24815	12.41	44737	7.66	69552	9.35
Innovative Founder	24815	1.66	44737	0.68	69552	1.03

Panel C: Entrepreneurial Propensity by Career Path

	Stayed in Engineering (%)	Moved to Finance (%)	Total (%)
Founder (5 years after grad)	2.76	3.20	2.82
Founder (10 years after grad)	5.25	7.07	5.49
Founder (All years)	8.73	13.47	9.35
Innovative Founder	0.98	1.38	1.03

Table 5: Are Students With Honors More Likely to Move to Finance?

This table reports the fractions of students that graduated with honors (i.e., *cum laude*, *summa cum laude*, or *magna cum laude*). Column (1) presents the fraction of students that graduated with honors and took a job in a non-financial firm at graduation. Column (2) presents the fraction of students that graduated with honors and took a job in a financial firm at graduation. Column (3) presents the fraction of students that graduated with honors and took a job in a non-financial firm within 5 years of graduation, after taking a job in a non-financial firm at graduation. Column (4) presents the fraction of students that graduated with honors and took a job in a financial firm within 5 years of graduation, after taking a job in a non-financial firm at graduation.

	(1)		(2)		(3)		(4)	
	Non-Fin. at Grad		Fin. at Grad		Stay Eng. ($\leq$5y)		Move Fin. ($\leq$5y)	
	#Eng	% Honors	#Eng	% Honors	#Eng	% Honors	#Eng	% Honors
Commencement Programs:	5426	0.21	386	0.12	5037	0.20	389	0.26
California Institute of Technology	801	0.40	26	0.15	772	0.40	29	0.48
Northwestern University	2478	0.12	188	0.12	2281	0.12	197	0.16
Stanford University	2147	0.10	172	0.09	1984	0.09	163	0.13
Reported on Online Resume	55217	0.08	2729	0.10	52736	0.08	2641	0.10

Table 6: Does Financial Sector Growth Attract Engineers from Other Sectors?

This table reports the coefficient estimates of the following linear probability regression model:

$$
\begin{aligned}
\text{Prob. Switch to Finance}_i &= \beta_1 \times \text{MSA Finance Share 1990}_i \\
&+ \text{MSA Controls} \\
&+ \text{School-GraduationYear-Major FE} \\
&+ \text{Firm Size Class FE} \\
&+ \text{3-Digit NAICS FE} + \varepsilon_i,
\end{aligned}
$$

where $\text{Prob. Switch to Finance}_i$ is the probability that engineer i moves to finance between 2000 and 2008, $\text{MSA Finance Share 1990}_i$ is the metropolitan share of workers with college degree that work in the finance industry in 1990. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). All errors are robust and clustered at the metropolitan level.

	Prob. of Switching to Finance						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
MSA Finance Share 1990	0.761***	0.697***	0.688***				
	(9.66)	(7.61)	(7.55)				
MSA Finance Share 1990: Securities				1.053***	1.095***		
				(4.23)	(4.07)		
MSA Finance Share 1990: Credit Interme.				0.423**	0.374*		
				(2.28)	(1.84)		
MSA Finance Share 1980						0.698**	0.651**
						(2.57)	(2.51)
Log (Total Emp in MSA)		-0.003	-0.003	-0.003	-0.003	0.003	-0.001
		(-1.58)	(-1.51)	(-1.52)	(-1.49)	(1.24)	(-0.28)
Share of Workers w/ College in MSA		-0.036*	-0.036*	-0.029	-0.030		-0.043**
		(-1.93)	(-1.91)	(-1.56)	(-1.49)		(-2.07)
Emp Growth in MSA		-0.008	-0.008	-0.006	-0.005		-0.006
		(-0.49)	(-0.47)	(-0.33)	(-0.28)		(-0.35)
MSA Share Emp in Industry of Eng i		0.028	0.019	0.028	0.018		0.021
		(0.38)	(0.27)	(0.38)	(0.27)		(0.30)
MSA Growth in Emp in Industry of Eng i		-0.004	-0.003	-0.004	-0.003		-0.004
		(-0.97)	(-0.90)	(-0.92)	(-0.83)		(-0.95)
$\beta \times (X_{\text{p75th}} - X_{\text{25th}})$	1.84%	1.68%	1.66%	1.16%; .44%	1.2%; .39%	.91%	.85%
$\bar{Y}$	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%	5.3%
School FE	No	Yes	No	Yes	No	No	No
Graduation Year FE	No	Yes	No	Yes	No	No	No
Major FE	No	Yes	No	Yes	No	No	No
School-Year-Major FE	No	No	Yes	No	Yes	No	Yes
3-Digit NAICS FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Size Class FE	No	Yes	Yes	Yes	Yes	No	Yes
#Engineers	32567	31768	31768	31736	31736	32522	31723
R-squared	0.136	0.150	0.167	0.150	0.167	0.135	0.167

Table 7: Within Firm Analysis: Does Financial Sector Growth Attract Engineers?

The table reports the coefficient estimates of the following linear probability regression model:

$$\begin{aligned} \text{Prob. Switch to Finance}_i &= \beta_1 \times \text{MSA Finance Share 1990}_i \\ &+ \text{Firm FE} \\ &+ \text{School-GraduationYear-Major FE} \\ &+ \varepsilon_i, \end{aligned}$$

where $\text{Prob. Switch to Finance}_i$ is the probability that engineer i moves to finance between 2000 and 2008, $\text{MSA Finance Share 1990}_i$ is the metropolitan share of workers with college degree that work in the finance industry in 1990. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). All errors are robust and clustered at the metropolitan level.

	Prob. of Switching to Finance						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
MSA Finance Share 1990	0.370**	0.314**	0.344**				
	(2.48)	(2.15)	(2.26)				
MSA Finance Share 1990: Securities				0.570*	0.655**		
				(1.96)	(2.20)		
MSA Finance Share 1990: Credit Interme.						0.540**	0.563**
						(2.14)	(2.09)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
School FE	No	Yes	No	Yes	No	Yes	No
Graduation Year FE	No	Yes	No	Yes	No	Yes	No
Major FE	No	Yes	No	Yes	No	Yes	No
School-Year-Major FE	No	No	Yes	No	Yes	No	Yes
#Engineers	19657	19657	19657	19655	19655	19657	19657
R-squared	0.193	0.200	0.223	0.200	0.223	0.200	0.223

Table 8: Do Major Financial Centers Drive the Results?

The table reports the coefficient estimates of the following linear probability regression model:

$$\begin{aligned} \text{Prob. Switch to Finance}_i &= \beta_1 \times \text{MSA Finance Share 1990}_i \\ &+ \text{MSA Controls} \\ &+ \text{School-GraduationYear-Major FE} \\ &+ \text{Firm Size Class FE} \\ &+ \text{3-Digit NAICS FE} + \varepsilon_i, \end{aligned}$$

where $\text{Prob. Switch to Finance}_i$ is the probability that engineer i moves to finance between 2000 and 2008, $\text{MSA Finance Share 1990}_i$ is the metropolitan share of workers with college degree that work in the finance industry in 1990. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). Column (3) and (4) report the estimated coefficients for the subsample without engineers working in New York metro area, which includes parts of New Jersey. Column (5) and (6) report the estimated coefficients for the subsample without engineers working in New York, Chicago, and Bridgeport-Stamford-Norwalk, CT metro areas. All errors are robust and clustered at the metropolitan level.

	Full Sample		No NYC Metro		No NYC, CT, & Chicago	
	(1)	(2)	(3)	(4)	(5)	(6)
MSA Finance Share 1990	0.768***	0.688***	0.674***	0.613***	0.680***	0.587***
	(6.95)	(7.55)	(4.74)	(6.55)	(3.10)	(3.65)
Log (Total Emp in MSA)	-0.000	-0.003	-0.000	-0.003	-0.000	-0.003
	(-0.09)	(-1.51)	(-0.42)	(-1.62)	(-0.21)	(-1.47)
Share of Workers w/ College in MSA		-0.036*		-0.035*		-0.035
		(-1.91)		(-1.80)		(-1.62)
Emp Growth in MSA		-0.008		-0.009		-0.011
		(-0.46)		(-0.54)		(-0.63)
MSA Share Emp in Industry of Eng i		0.018		-0.045		-0.043
		(0.26)		(-0.90)		(-0.83)
MSA Growth in Emp in Industry of Eng i		-0.003		-0.002		-0.001
		(-0.91)		(-0.42)		(-0.16)
$\beta \times (X_{\text{p75th}} - X_{\text{25th}})$	1.85%	1.66%	1.63%	1.48%	1.64%	1.42%
$\bar{Y}$	5.3%	5.3%	4.92%	4.92%	4.9%	4.9%
School FE	No	No	No	No	No	No
Graduation Year FE	No	No	No	No	No	No
Major FE	No	No	No	No	No	No
School-Year-Major FE	No	Yes	No	Yes	No	Yes
3-Digit NAICS FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm Size Class FE	No	Yes	No	Yes	No	Yes
#Engineers	32567	31768	29984	29185	29205	28406
R-squared	0.136	0.167	0.086	0.118	0.084	0.118

Table 9: Time Variation: Does Financial Sector Growth Attract Engineers from Other Sectors?

The table reports the coefficient estimates of the following linear probability regression model:

$$\begin{aligned}
\text{Prob. Switch to Finance}_i &= \beta_1 \times \text{Cohort 04 \& 05}_i \times \text{MSA Finance Share 1990}_i \\
&+ \beta_2 \times \text{Cohort 04 \& 05}_i \\
&+ \beta_3 \times \text{MSA Finance Share 1990}_i \\
&+ \text{MSA Controls} \\
&+ \text{School-GraduationYear-Major FE} \\
&+ \text{Firm Size Class FE} \\
&+ \text{3-Digit NAICS FE} + \varepsilon_i.
\end{aligned}$$

where Cohort 04 & 05_i equals one if an engineer graduated in 2004 or 2005, and equals zero if an engineer graduated in 1998 or 1999. Prob. Switch to Finance_i equals one if engineer i who graduated in 2004 or 2005 moves to finance in 2006 or 2007, or if engineer i who graduated in 1998 or 1999 moves to finance in 2000 or 2001. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). All errors are robust and clustered at the metropolitan level.

	Switch to Finance in 06 & 07 vs 00 & 01		
	(1)	(2)	(3)
Cohort 04 & 05 × MSA Finance Share 1990	0.664***	0.741***	0.767***
	(3.69)	(4.22)	(4.17)
Cohort 04 & 05	-0.021***	-0.023***	-0.013
	(-2.96)	(-3.21)	(-1.04)
MSA Finance Share 1990	0.119	-0.197***	-0.258**
	(1.31)	(-2.81)	(-2.49)
Log (Total Emp in MSA)			-0.000
			(-0.11)
Share of Workers w/ College in MSA			-0.005
			(-0.58)
Emp Growth in MSA			0.004
			(0.35)
MSA Share Emp in Industry of Eng i			0.047
			(0.78)
MSA Growth in Emp in Industry of Eng i			0.005*
			(1.78)
$\beta \times (X_{\text{p75th}} - X_{25\text{th}})$	1.6%	1.79%	1.85%
$\bar{Y}$	1.49%	1.49%	1.49%
School FE	No	No	No
Graduation Year FE	No	No	No
Major FE	No	No	No
School-Year-Major FE	No	No	Yes
3-Digit NAICS FE	No	Yes	Yes
Firm Size Class FE	No	No	Yes
#Engineers	13988	13988	13653
R-squared	0.008	0.091	0.115

Table 10: Hometown: Does Financial Sector Growth Attract Engineers?

The table reports the coefficient estimates of the following linear probability regression model:

$$\begin{aligned} \text{Prob. Switch to Finance}_i &= \beta_1 \times \text{MSA Hometown Finance 1990}_i \\ &+ \text{School-GraduationYear-Major FE} \\ &+ \text{Firm Size Class FE} \\ &+ \text{3-Digit NAICS FE} + \varepsilon_i, \end{aligned}$$

where Prob. Switch to Finance_i is the probability that engineer i moves to finance between 2000 and 2008, MSA Hometown Finance 1990_i is the metropolitan share of workers with college degree that work in the finance industry in 1990 in the hometown of Engineer i. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). All errors are robust and clustered at the School-year-major level.

	Prob. of Switching to Finance		
	(1)	(2)	(3)
MSA Hometown Fin 1990	0.703*	0.716**	0.658**
	(1.90)	(2.15)	(2.55)
$\beta \times (X_{\text{p75th}} - X_{\text{25th}})$	1.18%	1.21%	1.11%
$\bar{Y}$	6.34%	6.34%	6.34%
School FE	Yes	Yes	No
Graduation Year FE	Yes	Yes	No
Major FE	Yes	Yes	No
School-Year-Major FE	No	No	Yes
3-Digit NAICS FE	No	Yes	Yes
Firm Size Class FE	No	Yes	Yes
#Engineers	1391	1391	1391
R-squared	0.026	0.166	0.209

Table 11: Does Finance Growth Attract Engineers Who Graduated from Top Ranked Schools?

Using subsamples of engineers who graduated from higher-ranked and other schools, the table reports the coefficient estimates of the following linear probability regression model:

$$\begin{aligned} \text{Prob. Switch to Finance}_i &= \beta_1 \times \text{MSA Finance Share 1990}_i \\ &+ \text{MSA Controls} \\ &+ \text{School-GraduationYear-Major FE} \\ &+ \text{Firm Size Class FE} + \text{3-Digit NAICS FE} + \varepsilon_i, \end{aligned}$$

where $\text{Prob. Switch to Finance}_i$ is the probability that engineer i moves to finance between 2000 and 2008, and $\text{MSA Finance Share 1990}_i$ is the metropolitan share of workers with college degree that work in the finance industry in 1990. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). Based on acceptance rates, the set of higher-ranked schools is MIT, Berkeley, Stanford, CalTech, Carnegie Mellon, and Cornell. All errors are robust and clustered at the metropolitan level.

	Higher-ranked Schools		Other Schools	
	(1)	(2)	(3)	(4)
MSA Finance Share 1990	1.204***	1.200***	0.443***	0.381***
	(4.50)	(4.67)	(4.78)	(3.16)
Log (Total Emp in MSA)	-0.005*	-0.007*	0.002**	-0.000
	(-1.78)	(-1.83)	(1.98)	(-0.04)
Share of Workers w/ College in MSA		-0.019		-0.042**
		(-0.50)		(-2.52)
Emp Growth in MSA		-0.022		-0.007
		(-0.59)		(-0.41)
MSA Share Emp in Industry of Eng i		0.057		-0.014
		(0.64)		(-0.16)
MSA Growth in Emp in Industry of Eng i		-0.016**		0.003
		(-2.34)		(0.72)
$\beta \times (X_{\text{p75th}} - X_{\text{25th}})$	2.91%	2.9%	1.07%	.92%
$\bar{Y}$	7.02%	7.02%	4.4%	4.4%
School FE	No	No	No	No
Graduation Year FE	No	No	No	No
Major FE	No	No	No	No
School-Year-Major FE	No	Yes	No	Yes
3-Digit NAICS FE	Yes	Yes	Yes	Yes
Firm Size Class FE	No	Yes	No	Yes
#Engineers	11140	10754	21426	21013
R-squared	0.164	0.200	0.114	0.142

Table 12: Does Finance Growth Attract Engineers who Received Graduation Honors?

Using subsamples of engineers who graduated with and without honors , the table reports the coefficient estimates of the following linear probability regression model:

$$
\begin{aligned}
\text{Prob. Switch to Finance}_i &= \beta_1 \times \text{MSA Finance Share 1990}_i \\
&+ \text{MSA Controls} \\
&+ \text{School-GraduationYear-Major FE} \\
&+ \text{Firm Size Class FE} + \text{3-Digit NAICS FE} + \varepsilon_i,
\end{aligned}
$$

where Prob. Switch to Finance$_i$ is the probability that engineer i moves to finance between 2000 and 2008, and MSA Finance Share 1990$_i$ is the metropolitan share of workers with college degree that work in the finance industry in 1990. In the first four columns, we focus on students that received graduation honors from Stanford University, Northwestern University, and Caltech (S,N,C). For these universities, we identify honors students through the commencement programs published at graduation. In the last four columns, we identify students who received honors by using self-reported data in the ONBS platform. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). All errors are robust and clustered at the metropolitan level.

	Honors (S,N,C)		No Honors (S,N,C)		Honors (OBNS)		No Honors (OBNS)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MSA Finance Share 1990	2.696***	3.029***	0.428	0.516	1.228***	1.384***	0.743***	0.634***
	(3.94)	(5.17)	(0.68)	(0.77)	(3.97)	(4.42)	(6.93)	(6.53)
Log (Total Emp in MSA)	-0.022**	-0.017	0.007	-0.000	-0.008**	-0.005	0.000	-0.002
	(-2.18)	(-1.59)	(0.86)	(-0.00)	(-2.36)	(-1.06)	(0.41)	(-1.31)
Share of Workers w/ College in MSA		0.066		-0.070		0.055		-0.045**
		(0.67)		(-1.25)		(1.12)		(-2.44)
Emp Growth in MSA		-0.101		-0.065		-0.021		-0.002
		(-0.87)		(-1.37)		(-0.30)		(-0.15)
MSA Share Emp in Industry of Eng i		-0.429		0.143		0.202		0.014
		(-0.78)		(1.00)		(0.82)		(0.21)
MSA Growth in Emp in Ind. of Eng i		-0.075**		-0.021		-0.015		-0.003
		(-2.37)		(-1.55)		(-0.66)		(-0.83)
$\beta \times (X_{\text{p75th}} - X_{\text{25th}})$	6.51%	7.31%	1.03%	1.24%	2.97%	3.34%	1.79%	1.53%
$\bar{Y}$	8.06%	8.06%	6.78%	6.78%	6.3%	6.3%	5.21%	5.21%
School FE	No	Yes	No	Yes	No	No	No	No
Graduation Year FE	No	Yes	No	Yes	No	No	No	No
Major FE	No	Yes	No	Yes	No	No	No	No
School-Year-Major FE	No	No	No	No	No	Yes	No	Yes
3-Digit NAICS FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Size Class FE	No	Yes	No	Yes	No	Yes	No	Yes
#Engineers	638	625	2794	2715	2672	2623	29894	29144
R-squared	0.294	0.334	0.121	0.158	0.152	0.305	0.136	0.170

Table 13: Does Finance Growth Lead to an Education-Occupation Mismatch?

The table reports the coefficient estimates of the following linear probability regression model:

$$\begin{aligned}\text{Prob. Switch to Finance (or Engineering) Occupation}_i &= \beta_1 \times \text{MSA Finance Share 1990}_i \\ &+ \text{MSA Controls} \\ &+ \text{School-GraduationYear-Major FE} \\ &+ \text{Firm Size Class FE} \\ &+ \text{3-Digit NAICS FE} + \varepsilon_i,\end{aligned}$$

where Prob. Switch to Finance_i is the probability that engineer i moves to finance between 2000 and 2008, MSA Finance Share 1990_i is the metropolitan share of workers with college degree that work in the finance industry in 1990. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). Based on acceptance rates, the set of higher-ranked schools is MIT, Berkeley, Stanford, CalTech, Carnegie Mellon, and Cornell. All errors are robust and clustered at the metropolitan level.

	Engineering Occupations		Finance Occupations	
	(1) Higher-ranked	(2) Others	(3) Higher-ranked	(4) Others
MSA Finance Share 1990	0.549***	0.164***	0.653***	0.218*
	(7.30)	(3.19)	(2.94)	(1.77)
Log (Total Emp in MSA)	-0.005***	-0.001*	-0.002	0.001
	(-2.66)	(-1.74)	(-0.73)	(0.73)
Share of Workers w/ College in MSA	0.013	-0.010	-0.032	-0.031**
	(0.64)	(-1.62)	(-1.23)	(-2.09)
Emp Growth in MSA	0.005	0.011	-0.027	-0.017
	(0.32)	(1.26)	(-0.95)	(-1.21)
MSA Share Emp in Industry of Eng i	-0.024	-0.048	0.081	0.034
	(-0.71)	(-1.41)	(1.12)	(0.37)
MSA Growth in Emp in Industry of Eng i	-0.011***	0.002	-0.004	0.001
	(-3.40)	(1.10)	(-0.73)	(0.23)
$\beta \times (X_{\text{p75th}} - X_{\text{25th}})$	1.33%	.4%	1.58%	.53%
$\bar{Y}$	1.47%	1.34%	5.55%	3.06%
School FE	No	No	No	No
Graduation Year FE	No	No	No	No
Major FE	No	No	No	No
School-Year-Major FE	Yes	Yes	Yes	Yes
3-Digit NAICS FE	Yes	Yes	Yes	Yes
Firm Size Class FE	Yes	Yes	Yes	Yes
#Engineers	10758	21012	10758	21012
R-squared	0.053	0.064	0.188	0.103

Table 14: Financial Sector Growth and Innovative Entrepreneurship

The table reports the coefficient estimates of the following linear probability regression model:

$$
\begin{aligned}
\text{Prob. (Innovative) Entrepreneur}_i &= \beta_1 \times \text{Move to Finance}_{00-08} \times \text{MSA Emp Share in Finance}_{i,1990} \\
&+ \beta_2 \times \text{Move to Finance}_{00-08} \\
&+ \beta_3 \times \text{MSA Emp Share in Finance}_{i,1990} \\
&+ \mathit{MSA\ Controls} + \text{School-GraduationYear-Major FE} \\
&+ \text{Firm-Industry FE} + \text{Firm-Size FE} + \varepsilon_i.
\end{aligned}
$$

In the first two columns, we use as outcome variable the probability of becoming an entrepreneur, and in the last four columns the probability of becoming an innovative entrepreneur. An innovative entrepreneur is a entrepreneur who creates a firm that has at least on registered patent. Move to Finance$_{00-08}$ is an indicator equal to one if the engineer moved to the finance industry between 2000 and 2008. MSA Finance Share 1990$_i$ is the metropolitan share of workers with college degree that work in the finance industry in 1990. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Based on acceptance rates, the set of higher-ranked schools includes MIT, Berkeley, Stanford, CalTech, Carnegie Mellon, and Cornell. All errors are robust and clustered at the metropolitan level.

	Entrepreneurship		Innovative Entrepreneurship			
	(1)	(2)	(3)	(4)	(5)	(6)
	All	All	All	All (Ent≥2)	Higher	Others
Moved to Finance × MSA Finance Share 1990	-0.834***	-0.804***	-0.242***	-0.182**	-0.308**	-0.136
	(-2.85)	(-2.82)	(-2.95)	(-2.41)	(-1.99)	(-0.89)
MSA Finance Share 1990	0.243	0.197	-0.003	-0.006	-0.002	-0.005
	(1.13)	(0.99)	(-0.05)	(-0.10)	(-0.03)	(-0.07)
Moved to Finance	0.053***	0.048***	0.011**	0.008*	0.013	0.007
	(2.95)	(2.86)	(2.22)	(1.82)	(1.26)	(0.91)
Share of Workers w/ College in MSA		0.009	0.005	0.005	0.004	0.007
		(0.31)	(0.47)	(0.55)	(0.32)	(0.67)
Emp Growth in MSA		-0.103**	-0.030**	-0.028**	-0.052***	-0.021**
		(-2.07)	(-2.51)	(-2.42)	(-2.72)	(-2.07)
Log (Total Emp in MSA)		0.001	0.000	0.000	0.001	-0.000
		(0.22)	(0.27)	(0.23)	(0.90)	(-0.28)
MSA Share Emp in Industry of Eng i		0.064	-0.001	-0.002	-0.007	-0.003
		(0.66)	(-0.06)	(-0.07)	(-0.17)	(-0.13)
MSA Growth in Emp in Industry of Eng i		0.012*	-0.003*	-0.003	-0.007*	-0.001
		(1.78)	(-1.79)	(-1.65)	(-1.77)	(-0.66)
Constant	0.057	0.054	0.000	0.001	-0.034*	0.007
	(1.31)	(1.12)	(0.04)	(0.06)	(-1.76)	(0.52)
$\beta \times (X_{\text{p75th}} - X_{\text{25th}})$	-2.01%	-1.94%	-.58%	-.44%	-.74%	-.33%
$\bar{Y}$	9.99%	9.99%	1.1%	1.03%	1.81%	.72%
School FE	No	No	No	No	No	No
Graduation Year FE	No	No	No	No	No	No
Major FE	No	No	No	No	No	No
School-Year-Major FE	Yes	Yes	Yes	Yes	Yes	Yes
3-Digit NAICS FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm Size Class FE	Yes	Yes	Yes	Yes	Yes	Yes
#Engineers	32569	31770	31770	31644	10754	21016
R-squared	0.047	0.049	0.035	0.034	0.045	0.018

Table 15: Hometown: Financial Sector Growth and Innovative Entrepreneurship

The table reports the coefficient estimates of the following linear probability regression model:

$$\begin{aligned}\text{Prob. (Innovative) Entrepreneur}_i &= \beta_1 \times \text{Move to Finance}_{00-08} \times \text{MSA Hometown Finance}_{i,1990} \\ &+ \beta_2 \times \text{Move to Finance}_{00-08} \\ &+ \beta_3 \times \text{MSA Hometown Finance}_{i,1990} \\ &+ \mathit{MSA\ Controls} + \text{School-GraduationYear-Major FE} \\ &+ \text{Firm-Industry FE} + \text{Firm-Size FE} + \varepsilon_i.\end{aligned}$$

In the first two columns, we use as outcome variable the probability of becoming an entrepreneur, and in the last two columns the probability of becoming an innovative entrepreneur. An innovative entrepreneur is a entrepreneur who creates a firm that has at least on registered patent. Move to Finance_{00-08} is an indicator equal to one if the engineer moved to the finance industry between 2000 and 2008. MSA Hometown Finance 1990_i is the metropolitan share of workers with college degree that work in the finance industry in 1990 in the Hometown of Engineer i. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). This regression only includes engineers from Stanford and Caltech (S,C) for whom we identified the hometown location in the commencement programs. All errors are robust and clustered at the metropolitan level.

	Entrepreneurship		Innovative Entrepreneurship	
	(1)	(2)	(3)	(4)
	(S,C)	(S,C) (Ent≥2)	(S,C)	(S,C) (Ent≥2)
Moved to Finance × MSA Hometown Fin 1990	-4.492*	-4.689*	-2.377***	-2.260***
	(-1.90)	(-1.94)	(-2.80)	(-2.86)
MSA Hometown Fin 1990	-0.729	-0.706	0.641**	0.560**
	(-1.59)	(-1.64)	(2.21)	(2.31)
Moved to Finance	0.150	0.160	0.078*	0.077*
	(1.23)	(1.32)	(1.71)	(1.69)
Constant	0.130***	0.105**	-0.000	0.001
	(2.88)	(2.61)	(-0.01)	(0.04)
$\beta \times (X_{\text{p75th}} - X_{25\text{th}})$	-7.56%	-7.9%	-4%	-3.81%
$\bar{Y}$	18.01%	16.81%	3.07%	2.79%
School FE	No	No	No	No
Graduation Year FE	No	No	No	No
Major FE	No	No	No	No
School-Year-Major FE	Yes	Yes	Yes	Yes
3-Digit NAICS FE	Yes	Yes	Yes	Yes
Firm Size Class FE	Yes	Yes	Yes	Yes
#Engineers	1387	1369	1387	1369
R-squared	0.133	0.135	0.080	0.079

ONLINE APPENDIX

Table A1: Moves to Finance by School and Year of Graduation

The panels below describe the cohorts that (1) started their careers in the finance industry at graduation, (2) moved to the financial sector within 5 years of graduation, after taking a job in the non-financial sector at graduation, and (3) switched jobs within 5 years of graduation within the non-financial sector. Panels A, and B report the breakdowns by year of graduation and school, respectively. In columns (1) and (2), *Total #Engineers* is the total number of engineers in each category (major, year of graduation, or school), and *% Move* is the fraction of total of engineers in that category who moved to another job in the financial sector; in column (3), *% Move* is the fraction of the total of engineers who moved to another job in the non-financial sector. The count of engineers in columns (2) and (3) is smaller than the count in column (1) because it excludes the engineers who started in the finance industry.

Panel A: Years of Graduation

	(1)		(2)		(3)	
	Finance out of College		Move to Finance ($\leq$5y)		Move to Eng ($\leq$5y)	
	#Engineers	% Move	#Engineers	% Move	#Engineers	% Move
1998	5118	4.24	4901	4.75	4901	44.48
1999	5354	3.40	5172	5.18	5172	47.64
2000	5861	3.94	5630	5.26	5630	47.51
2001	5668	3.81	5452	5.69	5452	48.79
2002	5775	4.09	5539	6.35	5539	52.18
2003	6144	4.44	5871	6.30	5871	53.18
2004	6091	4.93	5791	5.63	5791	55.69
2005	6164	5.37	5833	5.13	5833	57.35
2006	5898	6.21	5532	4.30	5532	59.20
2007	5873	6.42	5496	3.82	5496	61.50
2008	5785	6.14	5430	3.85	5430	62.03
2009	5821	5.12	5523	4.33	5523	63.70
Total	69552	4.86	66170	5.06	66170	54.56

Panel B: Schools

	(1)		(2)		(3)	
	Finance out of College		Move to Finance ($\leq$5y)		Move to Eng ($\leq$5y)	
	#Engineers	% Move	#Engineers	% Move	#Engineers	% Move
California Institute of Technology	1008	3.87	969	3.10	969	55.52
Carnegie Mellon University	4575	7.74	4221	5.52	4221	56.34
Cornell University	6301	9.55	5699	6.95	5699	53.38
Georgia Institute of Technology	11279	3.02	10938	4.36	10938	55.27
Massachusetts Institute of Technology	5656	7.66	5223	6.05	5223	52.33
Northwestern University	3197	7.60	2954	7.24	2954	52.51
Stanford University	4078	7.06	3790	6.75	3790	57.47
University of California, Berkeley	6673	3.18	6461	4.66	6461	58.55
University of California, Los Angeles	4478	3.35	4328	4.48	4328	55.48
University of Illinois, Urbana-Champaign	9071	4.22	8688	4.85	8688	53.43
University of Texas, Austin	7781	2.80	7563	4.47	7563	52.52
University of Wisconsin, Madison	5455	2.18	5336	3.26	5336	53.20
Total	69552	4.86	66170	5.06	66170	54.56

Table A2: Moves to Finance by Industry

Panel A below reports the distribution of 1-digit industries in which engineers take jobs at graduation. Panel B reports the fraction of engineers who move to the financial sector within 5 years of graduation after taking a job in the respective 1-digit NAICS industry at graduation. *Total #Engineers* is the total number of engineers employed in each industry, and *% Move* is the fraction of total of engineers who moved to another job in the financial sector.

Panel A: Distribution of Engineers by Industry after Graduation

	(1)	
	Dist. by Industry upon graduation	
	Total #Engineers	Fraction
Construction	1234	2.38
Education and Health	7627	14.70
Information	2442	4.71
Leisure, Hospitality	574	1.11
Manufacturing	16181	31.18
Natural Resources and Mining	2141	4.13
Other Services	125	0.24
Professional and Business Services	18277	35.22
Public Administration	1374	2.65
Real Estate	220	0.42
Trade, Trans, Utilities	1698	3.27
Total	51893	100.00

Panel B: Move to Finance by Industry

	(1)	
	Move to Finance ($\leq$5y)	
	Total #Engineers	% Move
Construction	1231	2.92
Education and Health	7564	2.92
Information	2415	5.18
Leisure, Hospitality	560	5.71
Manufacturing	16082	3.10
Natural Resources and Mining	2124	3.53
Other Services	125	4.80
Professional and Business Services	17828	6.43
Public Administration	1367	3.15
Real Estate	207	10.63
Trade, Trans, Utilities	1664	4.45
Total	51167	4.46

Table A3: Moves to Finance by Sub-industries

Panel A and B report the fraction of engineers who move to the financial sector within 5 years of graduation after taking a job in the respective 3-digit NAICS industry at graduation. Panel A focuses on the manufacturing industry, and Panel B focuses on professional and business services industries. *Total #Engineers* is the total number of engineers employed in each industry, and *% Move* is the fraction of total of engineers who moved to a job in the financial sector.

Panel A: Breakdown of Manufacturing Industry

	(1)	
	Move to Finance (≤5y)	
	Total #Engineers	% Move
Beverage and Tobacco Product Manufacturing	230	5.22
Chemical Manufacturing	2998	3.10
Computer and Electronic Product Manufacturing	4317	3.03
Machinery Manufacturing	3023	2.88
Other	617	3.89
Transportation Equipment Manufacturing	4897	3.10
Total	16082	3.10

Panel B: Breakdown of the Professional and Business Services Industries

	(1)	
	Move to Finance (≤5y)	
	Total #Engineers	% Move
Business, Legal, and Professional Services	2365	15.14
Computers and Information Technology	11479	6.11
Engineering Services (Architecture, Civil Engineering, Design, Logistics)	2541	1.89
Other Services	155	6.45
Research	1288	2.33
Total	17828	6.43

Table A4: Types of Jobs of Engineers in Finance

This table presents the types of jobs that engineers take when they move to the financial sector. Panel A focus on computer science majors, and Panel B focuses on non-computer science majors.

Panel A: Jobs of Computer Science Major Engineers in Finance

	(1)		(2)	
	Finance out of College		Move to Finance (≤5y)	
	#Engineers	Fraction	#Engineers	Fraction
IT/Software	629	34.26	610	38.63
Engineer	35	1.91	48	3.04
Trader/Quant/Port. Manager	319	17.37	193	12.22
Analyst/Associate/IB	514	28.00	317	20.08
VP/President	75	4.08	82	5.19
Manager/Partner	88	4.79	145	9.18
Intern	35	1.91	42	2.66
Other	141	7.68	142	8.99
Total	1836	100.00	1579	100.00

Panel B: Jobs of NON Computer Science Major Engineers in Finance

	(1)		(2)	
	Finance out of College		Move to Finance (≤5y)	
	#Engineers	Fraction	#Engineers	Fraction
IT/Software	129	8.34	162	9.15
Engineer	39	2.52	48	2.71
Trader/Quant/Port. Manager	400	25.87	427	24.11
Analyst/Associate/IB	622	40.23	597	33.71
VP/President	36	2.33	83	4.69
Manager/Partner	116	7.50	178	10.05
Intern	42	2.72	57	3.22
Other	162	10.48	219	12.37
Total	1546	100.00	1771	100.00

Table A5: Effects for Manufacturing and Professional Services Industries

The table reports the coefficient estimates of the following linear probability regression model:

$$\begin{aligned}\text{Prob. Switch to Finance}_i &= \beta_1 \times \text{MSA Finance Share 1990}_i \\ &+ \text{MSA Controls} \\ &+ \text{School-Year graduation-Major FE} \\ &+ \text{Firm Size Class FE} \\ &+ \text{3-Digit NAICS FE} + \varepsilon_i,\end{aligned}$$

where $\text{Prob. Switch to Finance}_i$ is the probability that engineer i moves to finance between 2000 and 2008, $\text{MSA Finance Share 1990}_i$ is the metropolitan share of workers with college degree that work in the finance industry in 1990. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). All errors are robust and clustered at the metropolitan level.

	Manufacturing	Prof. & Serv.
	(1)	(2)
MSA Finance Share 1990	0.215	1.411***
	(1.35)	(6.30)
Share of Workers w/ College in MSA	-0.017	-0.104**
	(-0.87)	(-2.00)
Emp Growth in MSA	-0.010	0.044*
	(-0.63)	(1.83)
Log (Total Emp in MSA)	-0.001	-0.014***
	(-0.24)	(-3.02)
MSA Share Emp in Industry of Eng i	-0.104	0.234*
	(-1.58)	(1.88)
MSA Growth in Emp in Industry of Eng i	0.004	-0.019**
	(1.10)	(-2.01)
$\beta \times (X_{\text{p75th}} - X_{\text{25th}})$	.52%	3.41%
$\bar{Y}$	3.04%	6.67%
School FE	No	No
Graduation Year FE	No	No
Major FE	No	No
School-Year-Major FE	Yes	Yes
3-Digit NAICS FE	Yes	Yes
Firm Size Class FE	Yes	Yes
#Engineers	8824	9632
R-squared	0.076	0.089

Table A6: Effects by Major

The table reports the coefficient estimates of the following linear probability regression model:

$$\begin{aligned}\text{Prob. Switch to Finance}_i &= \beta_1 \times \text{MSA Finance Share 1990}_i \\ &+ \text{MSA Controls} \\ &+ \text{School-Year graduation-Major FE} \\ &+ \text{Firm Size Class FE} \\ &+ \text{3-Digit NAICS FE} + \varepsilon_i,\end{aligned}$$

where $\text{Prob. Switch to Finance}_i$ is the probability that engineer i moves to finance between 2000 and 2008, $\text{MSA Finance Share 1990}_i$ is the metropolitan share of workers with college degree that work in the finance industry in 1990. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). All errors are robust and clustered at the metropolitan level.

	Civil Eng	Computer Eng	Electrical Eng	Mechanical Eng	Chemical Eng
	(1)	(2)	(3)	(4)	(5)
MSA Finance Share 1990	0.588**	1.114***	0.613***	0.322**	0.349**
	(2.39)	(6.21)	(2.78)	(2.15)	(1.99)
Share of Workers w/ College in MSA	-0.013	-0.057	-0.018	-0.011	-0.066
	(-0.55)	(-1.55)	(-0.71)	(-0.38)	(-1.60)
Emp Growth in MSA	0.030	-0.000	-0.026	-0.033	0.002
	(1.24)	(-0.00)	(-1.00)	(-1.17)	(0.08)
Log (Total Emp in MSA)	-0.005	-0.008**	-0.002	0.003	-0.002
	(-1.63)	(-2.27)	(-0.58)	(1.03)	(-0.59)
MSA Share Emp in Industry of Eng i	0.053	0.052	0.001	0.063	-0.181*
	(0.48)	(0.45)	(0.01)	(0.68)	(-1.68)
MSA Growth in Emp in Industry of Eng i	-0.008	-0.002	-0.010	-0.005	0.015*
	(-0.87)	(-0.24)	(-1.63)	(-0.60)	(1.91)
$\beta \times (X_{\text{p75th}} - X_{\text{25th}})$	1.42%	2.69%	1.48%	.78%	.84%
$\bar{Y}$	2.29%	7.01%	4.67%	5.08%	3.81%
School FE	No	No	No	No	No
Graduation Year FE	No	No	No	No	No
Major FE	No	No	No	No	No
School-Year-Major FE	Yes	Yes	Yes	Yes	Yes
3-Digit NAICS FE	Yes	Yes	Yes	Yes	Yes
Firm Size Class FE	Yes	Yes	Yes	Yes	Yes
#Engineers	3171	11960	3626	6996	4547
R-squared	0.154	0.154	0.207	0.221	0.149

Table A7: Effects after 2008

The table reports the coefficient estimates of the following linear probability regression model:

$$\begin{aligned}\text{Prob. Switch to Finance}_i &= \beta_1 \times \text{MSA Finance Share 1990}_i \\ &+ \text{MSA Controls} \\ &+ \text{School-Year graduation-Major FE} \\ &+ \text{Firm Size Class FE} \\ &+ \text{3-Digit NAICS FE} + \varepsilon_i,\end{aligned}$$

where *Prob. Switch to Finance*$_i$ is the probability that engineer i moves to finance from 2008 to 2010 in the first two columns and from 2011 to 2016 in the last two columns, MSA Finance Share 1990$_i$ is the metropolitan share of workers with college degree that work in the finance industry in 1990. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). All errors are robust and clustered at the metropolitan level.

	Switch 2008 to 2010		Switch 2011 to 2016	
	(1)	(2)	(3)	(4)
MSA Finance Share 1990: Credit Interme.	0.366***	0.459***	0.757***	0.859***
	(2.95)	(3.54)	(4.75)	(4.14)
Log (Total Emp in MSA)		-0.002**		-0.002
		(-2.42)		(-1.41)
Share of Workers w/ College in MSA		-0.020**		-0.008
		(-2.12)		(-0.70)
Emp Growth in MSA		-0.004		-0.019
		(-0.51)		(-0.92)
MSA Share Emp in Industry of Eng i		0.006		0.011
		(0.16)		(0.16)
MSA Growth in Emp in Industry of Eng i		-0.002		-0.005
		(-0.70)		(-1.57)
$\beta \times (X_{\text{p75th}} - X_{\text{25th}})$	.38%	.48%	.79%	.89%
$\bar{Y}$	1.58%	1.58%	3.94%	3.94%
School FE	No	No	No	No
Graduation Year FE	No	No	No	No
Major FE	No	No	No	No
School-Year-Major FE	No	Yes	No	Yes
3-Digit NAICS FE	Yes	Yes	Yes	Yes
Firm Size Class FE	No	Yes	No	Yes
#Engineers	30078	29361	30484	29752
R-squared	0.021	0.042	0.008	0.028

Table A8: Effects Excluding Moves from Management Consulting

The table reports the coefficient estimates of the following linear probability regression model:

$$\begin{aligned} \text{Prob. Switch to Finance}_i &= \beta_1 \times \text{MSA Finance Share 1990}_i \\ &+ \text{MSA Controls} \\ &+ \text{School-Year graduation-Major FE} \\ &+ \text{Firm Size Class FE} \\ &+ \text{3-Digit NAICS FE} + \varepsilon_i, \end{aligned}$$

where *Prob. Switch to Finance*$_i$ is the probability that engineer i moves to finance between 2000 and 2008, MSA Finance Share 1990$_i$ is the metropolitan share of workers with college degree that work in the finance industry in 1990. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). All errors are robust and clustered at the metropolitan level.

	Prob. of Switching to Finance				
	(1)	(2)	(3)	(4)	(5)
MSA Finance Share 1990	0.695***	0.652***	0.636***	0.629***	0.632***
	(5.43)	(5.76)	(5.82)	(6.39)	(6.51)
Log (Total Emp in MSA)	-0.000	-0.001	-0.002	-0.002	-0.002
	(-0.36)	(-0.75)	(-1.16)	(-1.51)	(-1.45)
Share of Workers w/ College in MSA		-0.012	-0.014	-0.026	-0.026
		(-0.68)	(-0.84)	(-1.58)	(-1.56)
Emp Growth in MSA		-0.029	-0.021	-0.014	-0.013
		(-1.61)	(-1.28)	(-0.89)	(-0.85)
MSA Share Emp in Industry of Eng i		-0.009	-0.034	-0.048	-0.051
		(-0.24)	(-0.95)	(-1.13)	(-1.18)
MSA Growth in Emp in Industry of Eng i		0.003	0.002	-0.001	-0.001
		(0.72)	(0.60)	(-0.32)	(-0.26)
$\beta \times (X_{\text{p75th}} - X_{\text{25th}})$	1.68%	1.58%	1.54%	1.52%	1.53%
$\bar{Y}$	5.01%	5.01%	5.01%	5.01%	5.01%
School FE	No	No	Yes	Yes	No
Graduation Year FE	No	Yes	Yes	Yes	No
Major FE	No	No	No	Yes	No
School-Year-Major FE	No	No	No	No	Yes
3-Digit NAICS FE	Yes	Yes	Yes	Yes	Yes
Firm Size Class FE	No	No	No	Yes	Yes
#Engineers	31889	31101	31101	31101	31101
R-squared	0.144	0.154	0.155	0.158	0.174

Table A9: Migration of Engineers to Management Consulting

The table reports the coefficient estimates of the following linear probability regression model:

$$\begin{aligned} \text{Prob. Switch to Management Consulting}_i &= \beta_1 \times \text{MSA Finance Share 1990}_i \\ &+ \text{MSA Controls} \\ &+ \text{School-Year graduation-Major FE} \\ &+ \text{Firm Size Class FE} \\ &+ \text{3-Digit NAICS FE} + \varepsilon_i, \end{aligned}$$

where *Prob. Switch to Management Consulting*$_i$ is the probability that engineer i moves to management consulting industry between 2000 and 2008, MSA Finance Share 1990$_i$ is the metropolitan share of workers with college degree that work in the finance industry in 1990. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). All errors are robust and clustered at the metropolitan level.

	Prob. of Switching to Management Consulting				
	(1)	(2)	(3)	(4)	(5)
MSA Finance Share 1990	-0.008	-0.009	-0.001	0.001	0.003
	(-0.31)	(-0.36)	(-0.06)	(0.02)	(0.13)
Log (Total Emp in MSA)	0.000	0.000	0.000	0.000	0.000
	(0.26)	(0.95)	(1.00)	(0.97)	(1.06)
Share of Workers w/ College in MSA		0.003	0.003	0.004*	0.004
		(1.18)	(1.51)	(1.68)	(1.51)
Emp Growth in MSA		0.003	0.002	0.002	0.002
		(0.95)	(0.75)	(0.68)	(0.65)
MSA Share Emp in Industry of Eng i		-0.009	-0.007	-0.008	-0.007
		(-1.50)	(-1.27)	(-1.42)	(-1.32)
MSA Growth in Emp in Industry of Eng i		-0.001	-0.001	-0.001	-0.001
		(-1.16)	(-1.14)	(-0.97)	(-1.07)
$\beta \times (X_{\text{p75th}} - X_{\text{25th}})$	-.02%	-.02%	0%	0%	.01%
$\bar{Y}$	.14%	.14%	.14%	.14%	.14%
School FE	No	No	Yes	Yes	No
Graduation Year FE	No	Yes	Yes	Yes	No
Major FE	No	No	No	Yes	No
School-Year-Major FE	No	No	No	No	Yes
3-Digit NAICS FE	Yes	Yes	Yes	Yes	Yes
Firm Size Class FE	No	No	No	Yes	Yes
#Engineers	31889	31101	31101	31101	31101
R-squared	0.003	0.003	0.004	0.004	0.027

Table A10: Are the Results Driven by Double Majors?

The table reports the coefficient estimates of the following linear probability regression model:

$$\begin{aligned}\text{Prob. Switch to Finance}_i &= \beta_1 \times \text{MSA Finance Share 1990}_i \\ &+ \text{MSA Controls} \\ &+ \text{School-Year graduation-Major FE} \\ &+ \text{Firm Size Class FE} \\ &+ \text{3-Digit NAICS FE} + \varepsilon_i,\end{aligned}$$

where *Prob. Switch to Finance*$_i$ is the probability that engineer i moves to finance industry between 2000 and 2008, MSA Finance Share 1990$_i$ is the metropolitan share of workers with college degree that work in the finance industry in 1990. The first column includes all engineers in the sample, the second column includes engineers that only majored in engineering, and the third column only includes engineers that double majored in engineering and business administration, economics, or finance. Finance industry includes the securities industry (3-digit NAICS=523), and the credit intermediation industry (3-digit NAICS=522). Firm size fixed effect is based on three classes of employment size (below 1,000, between 1,000 and 10,000, and above 10,000 employees). All errors are robust and clustered at the metropolitan level.

	All	No Double	Double Major
	(1)	(2)	(3)
MSA Finance Share 1990	0.687***	0.618***	1.334
	(7.55)	(6.87)	(1.48)
Share of Workers w/ College in MSA	-0.036*	-0.033*	-0.028
	(-1.92)	(-1.81)	(-0.26)
Emp Growth in MSA	-0.008	-0.012	0.078
	(-0.47)	(-0.75)	(1.03)
Log (Total Emp in MSA)	-0.003	-0.002	0.003
	(-1.51)	(-1.42)	(0.24)
MSA Share Emp in Industry of Eng i	0.017	0.017	-0.031
	(0.25)	(0.25)	(-0.11)
MSA Growth in Emp in Industry of Eng i	-0.004	-0.004	0.034
	(-0.92)	(-0.95)	(0.86)
$\beta \times (X_{\text{p75th}} - X_{25\text{th}})$	1.66%	1.49%	3.22%
$\bar{Y}$	5.3%	4.96%	12.19%
School FE	No	No	No
Graduation Year FE	No	No	No
Major FE	No	No	No
School-Year-Major FE	Yes	Yes	Yes
3-Digit NAICS FE	Yes	Yes	Yes
Firm Size Class FE	Yes	Yes	Yes
#Engineers	31767	30381	1386
R-squared	0.167	0.163	0.406