# The Effect of Superstar Firms on College Major Choice

Darwin Choi, Dong Lou, Abhiroop Mukherjee

CUHK, LSE and CEPR, HKUST

July 25, 2018

NBER Summer Institute

# Motivation

# Motivation

- It has been of interest to economists the effect of salient, extreme events on human decision making
  - there is a recent, fast-growing literature that examines the role of salient, extreme events in driving agents' financial decisions
  - e.g., Barberis and Huang, 2008; Bordalo, Gennaioli, and Shleifer, 2012
- There is much less work on the impact of such events on other, likely more important, aspects of human decision making
- We shed new light on this issue by focusing on one of the most irreversible investment decisions
  - education and human capital investment

# Motivation

- Our paper studies the effect of superstar firms on college students' major choice
- Plenty of anecdotal evidence on this; Stanford Daily reported that
  - the number of students choosing Computer Science major in 2013 was nearly four times that in 2006
  - potentially attributable to the extreme successes of a handful of mobile app and social media companies
  - a prominent example of which is Facebook
- A New York Times article on June 15, 2011 indeed argues
  - "students are flocking to computer science because they dream of being the next Mark Zuckerberg"

# Two Potential Channels

- Superstar firms can affect college students' major choice through two related channels
- First, extreme stories tend to garner disproportionate media coverage and social attention
  - consequently, these events play a disproportionate large role in shaping student's expectations and decisions
- Second, occurrences of superstar firms often involve extreme payoffs
  - Mark Zuckerberg has been consistently named one of the world's richest people since Facebook went public
  - a long-standing literature in labor economics (e.g., Rosen, 1997) postulates that individuals have a preference for skewed payoffs

# Empirical Design

- First, we focus solely on the set of science and engineering majors (e.g., computer science vs. chemical engineering)
  - which can be mapped directly to one or more industry sectors (e.g., information technology vs. pharmaceutical)
- Second, to quantify extreme, salient events in each period
  - we use stock returns to capture value-relevant events
  - specifically, we measure industry "salience" by the *cross-sectional* return skewness in each industry
  - also more direct proxies of salience (news skewness, IPOs, defaults)
- Third, US college students declare major by sophomore year
  - we focus on industry return skewness measured in years -7 to -3 prior to the graduation year

# Preview of Main Results

- Positive salient, extreme events in an industry are associated with more college students choosing to major in related fields
  - as proxied by cross-sectional skewness in stock returns
  - also skewness in favorable news coverage
- Response to superstar firms has adverse impact on career outcomes
  - lower average wage earned by entry-level employees when additional students enter the job market
  - no significant change in new hires
  - adverse effects last for years, even decades
- Also exploit structural breaks in industry valuation in the tech bubble to provide more evidence in support of a labor supply channel

# Data and Methodology

# Data

- Graduation data from National Center for Education Statistics
  - #bachelor's and #master's degrees awarded in each science and engineering field every year (1966-2015, 11 major fields)
- Industry wage/employment from Bureau of Labor Statistics
  - entry-level positions that require a bachelor's degree (1997-)
- Long-term outcomes from National Survey of College Graduates
  - total income; whether work in related fields (1993-)
- Other financial data
  - news tones from RavenPack News Analytics (2000-)
  - IPOs from SDC (1975-); defaults from Compustat (1985-)

# List of Major Fields

Aeronautical and astronautical engineering
Chemical engineering
Civil engineering
Computer sciences
Earth and ocean sciences
Economics
Electrical engineering
Health
Industrial and manufacturing engineering
Materials science
Mechanical engineering

**These major fields are then mapped to related job codes (SOC), and industries (three-digit NAICS)**

# Summary Statistics

| | Median | 25th Perc | 75th Perc | Median(#) |
|---|---|---|---|---|
| Log Number of Bachelors | 8.763 | 8.074 | 9.716 | 6,391 |
| Log Number of Bachelors (Male) | 8.421 | 7.834 | 9.479 | 4,540 |
| Log Number of Bachelors (Female) | 7.147 | 5.602 | 7.696 | 1,270 |
| Log Number of Masters | 7.771 | 7.151 | 8.280 | 2,370 |
| Log Number of Bachelors (1997 - 2015) | 9.029 | 8.248 | 9.873 | 8,344 |
| Skew | 0.717 | 0.064 | 1.571 | |
| Mean Return | 0.120 | -0.053 | 0.298 | |
| Return Coefficient of Variation | 0.874 | -0.548 | 1.790 | |
| News Skew | 1.090 | 0.051 | 2.355 | |
| Log Number of IPOs | 0.070 | 0.027 | 0.141 | |
| Default Rate (%) | 0.000 | 0.000 | 0.026 | |
| Log Annual Wage (1997 Dollars) | 10.905 | 10.780 | 10.970 | $54,461 |
| Log Net New Hires | 0.022 | -0.011 | 0.044 | 6,950 |

# Main Results

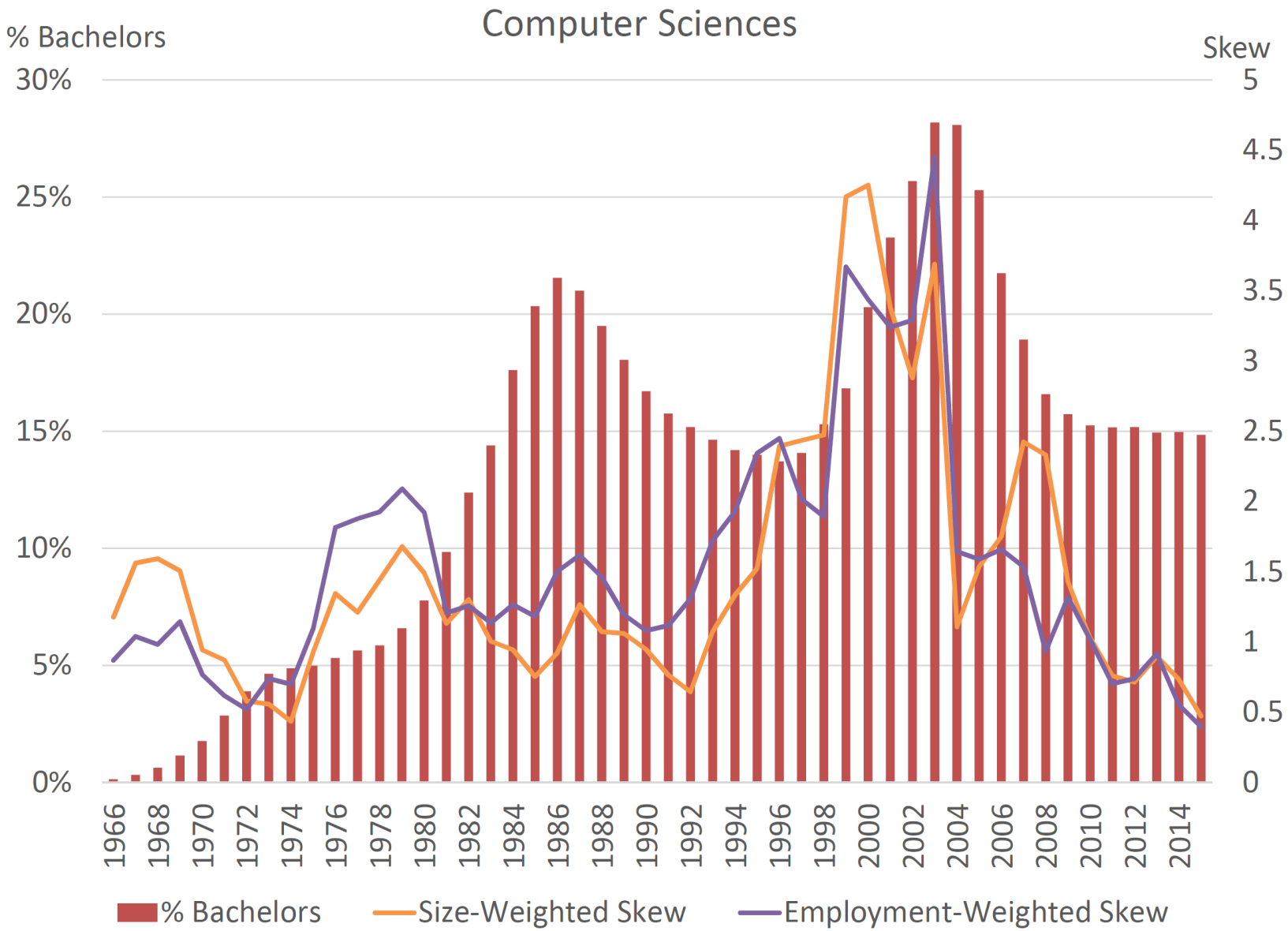
# Number of Graduates with Different Majors

- We start by analyzing the effect of industry return skewness on the number of graduates from related major fields
- We estimate the following regression equation:

$$log(bachelor_{i,t}) = \alpha + \beta skew_{i,t\text{-}3 \text{ to } t\text{-}7} + \gamma X_{i,t-3} + \mu_i + \tau_t + \varepsilon_{i,t}$$

  - $log(bachelor_{i,t})$: log #graduates in year $t$ in field $i$
  - $skew_{i,t\text{-}3 \text{ to } t\text{-}7}$: industry cross-sectional return skewness
  - $X_{i,t-3}$: industry-level controls (e.g., mean, stdev of returns)
  - $\mu_i$: major-fixed effects
  - $\tau_t$: time-fixed effects

# An Example: Computer Science



# Number of Graduates with Different Majors

| Weighting of RHS Variables | Log Number of Bachelors | | | |
|---|---|---|---|---|
| | Size | Employment | Employment | Employment |
| | (1) | (2) | (3) | (4) |
| Skew | 0.0948*** | 0.1010*** | | |
| | (0.0301) | (0.0189) | | |
| Skew_Monthly | | | 0.1003*** | |
| | | | (0.0371) | |
| Skew_Quarterly | | | | 0.0876** |
| | | | | (0.0389) |
| Mean Return | 0.0518* | 0.1027** | 0.0886** | 0.1052*** |
| | (0.0310) | (0.0402) | (0.0393) | (0.0389) |
| Return Coefficient of Variation | -0.0533*** | 0.0016 | -0.0003 | 0.0077 |
| | (0.0204) | (0.0154) | (0.0141) | (0.0146) |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| Major Fixed Effects | Yes | Yes | Yes | Yes |
| # Observations | 521 | 521 | 521 | 521 |
| Adj. R-Squared | 0.87 | 0.88 | 0.88 | 0.88 |

A one-stdev increase in industry return skewness in $t$-7 to $t$-3 forecasts a 10% increase in the number of year $t$ graduates in related majors

# Wages and Number of Employees

- One concern is that our result may be driven by labor demand
  - labor demand by some industries expected to rise in the future
  - this is somehow correlated with cross-sectional skewness
- To examine labor demand vs. supply channels, we simultaneously examine
  - wages (inflation-adjusted) vs. #net new hires
  - by examining the "price-quantity" pair, we can disentangle *relative* shifts in labor supply vs. demand
  - focus on entry-level positions that require a bachelor's degree

# Wages and #Employees

| | Log Annual Wage (1) | Net New Hires (2) | Log Annual Wage (3) | Net New Hires (4) |
|---|---|---|---|---|
| Skew | -0.0116*** | -0.0236 | -0.0127*** | -0.0171 |
| | (0.0041) | (0.0232) | (0.0042) | (0.0259) |
| Skew * Versatility | | | 0.0070** | -0.0108 |
| | | | (0.0036) | (0.0130) |
| Versatility | | | 0.0837*** | 0.0155 |
| | | | (0.0148) | (0.0434) |
| Mean Return | 0.0176*** | 0.0147 | 0.0127*** | 0.0154 |
| | (0.0058) | (0.0253) | (0.0045) | (0.0255) |
| Return Coefficient of Variation | -0.0040 | -0.0197 | -0.0031 | -0.0197 |
| | (0.0025) | (0.0176) | (0.0025) | (0.0176) |
| Log Number of Bachelors | 0.0946*** | 0.0027 | 0.0779*** | -0.0027 |
| | (0.0264) | (0.0191) | (0.0231) | (0.0150) |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | No | Yes | No |
| # Observations | 220 | 209 | 220 | 209 |
| Adj. R-Squared | 0.94 | 0.39 | 0.96 | 0.38 |

A one-stdev increase in skewness in $t$-7 to $t$-3 is associated with a 1.2% drop in the average wage earned by entry-level employees in year $t$

# Major Versatility

| | Log Annual Wage | Net New Hires | Log Annual Wage | Net New Hires |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Skew | -0.0116*** | -0.0236 | -0.0127*** | -0.0171 |
| | (0.0041) | (0.0232) | (0.0042) | (0.0259) |
| Skew * Versatility | | | 0.0070** | -0.0108 |
| | | | (0.0036) | (0.0130) |
| Versatility | | | 0.0837*** | 0.0155 |
| | | | (0.0148) | (0.0434) |
| Mean Return | 0.0176*** | 0.0147 | 0.0127*** | 0.0154 |
| | (0.0058) | (0.0253) | (0.0045) | (0.0255) |
| Return Coefficient of Variation | -0.0040 | -0.0197 | -0.0031 | -0.0197 |
| | (0.0025) | (0.0176) | (0.0025) | (0.0176) |
| Log Number of Bachelors | 0.0946*** | 0.0027 | 0.0779*** | -0.0027 |
| | (0.0264) | (0.0191) | (0.0231) | (0.0150) |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | No | Yes | No |
| # Observations | 220 | 209 | 220 | 209 |
| Adj. R-Squared | 0.94 | 0.39 | 0.96 | 0.38 |

Major versatility is defined as the concentration of employment in various industries (Herfindahl index)

# Skewness Measured in Years $t$-1 to $t$-2

| | Log Number of Bachelors | | Log Annual Wage | | Net New Hires | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Skew t-1 to t-2 | 0.0392 | 0.0446* | -0.0061 | -0.0045 | -0.0027 | 0.0002 |
| | (0.0292) | (0.0229) | (0.0044) | (0.0037) | (0.0304) | (0.0307) |
| Skew t-3 to t-7 | | 0.1058*** | | -0.0120*** | | -0.0271 |
| | | (0.0203) | | (0.0039) | | (0.0220) |
| Mean Return t-1 to t-2 | 0.0075 | 0.0010 | -0.0008 | 0.0025 | 0.0099 | -0.0002 |
| | (0.0328) | (0.0296) | (0.0066) | (0.0058) | (0.0224) | (0.0242) |
| Mean Return t-3 to t-7 | | 0.0982** | | 0.0177*** | | 0.0169 |
| | | (0.0387) | | (0.0062) | | (0.0260) |
| Return Coefficient of | -0.0183 | -0.0205** | 0.0007 | -0.0023 | -0.0052 | -0.0123 |
| Variation t-1 to t-2 | (0.0116) | (0.0096) | (0.0018) | (0.0021) | (0.0098) | (0.0127) |
| Return Coefficient of | | 0.0041 | | -0.0039 | | -0.0213 |
| Variation t-3 to t-7 | | (0.0154) | | (0.0029) | | (0.0207) |
| Log Number of Bachelors | | | 0.0810*** | 0.1006*** | 0.0009 | 0.0022 |
| | | | (0.0250) | (0.0263) | (0.0188) | (0.0201) |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Major Fixed Effects | Yes | Yes | Yes | Yes | No | No |
| # Observations | 521 | 521 | 220 | 220 | 209 | 209 |
| Adj. R-Squared | 0.87 | 0.88 | 0.94 | 0.94 | 0.38 | 0.38 |

Weak relations between skewness $t$-1 to $t$-2 and #graduates at $t$

# Long-Term Effects from NSCG

| | Log(Earnings) | Log(Earnings) | 1(Job Outside Field of Study) | 1(Job Outside Field of Study) |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Skew | -0.0057** | -0.0088*** | 0.046*** | 0.0478*** |
| | (0.0028) | (0.0029) | (0.0161) | (0.0164) |
| Mean Return | 0.0109*** | 0.0138*** | -0.0078 | 0.0068 |
| | (0.0025) | (0.0025) | (0.012) | (0.0122) |
| Return Coefficient of Variation | 0.0178*** | 0.0201*** | -0.0249* | -0.0247* |
| | (0.0026) | (0.0026) | (0.012) | (0.013) |
| Age-related Controls | Age, Age-squared | Age Fixed Effects | Age, Age-squared | Age Fixed Effects |
| Minority Status Fixed Effect | Yes | Yes | Yes | Yes |
| Gender Fixed Effect | Yes | Yes | Yes | Yes |
| Marital Status Fixed Effect | Yes | Yes | Yes | Yes |
| Major Fixed Effects | Yes | Yes | Yes | Yes |
| Survey Year Fixed Effects | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | Yes | Yes | Yes |
| # Observations | 93,633 | 93,633 | 109,860 | 109,860 |
| Adj. R-Squared | 0.20 | 0.20 | 0.12 | 0.12 |

A one-std increase in skewness lowers annual total income by 88bps, increases the likelihood of leaving related fields by 4%

# Wages and #Employees: Summary

- Our results suggest a relatively larger shift in labor supply
- In the short run, labor demand is relatively inelastic
  - as it takes times for firms to increase investment
  - a sudden increase in labor supply lowers the average wage earned by entry-level employees
  - without affecting number of new hires at the entry-level
- The adverse effect lasts for years/decades
  - lower income + higher likelihoods of leaving related fields

# Operating Performance

- Wages and employment do not seem to indicate that the response to industry skewness reflects rational expectations of better job opportunities
- It may be the case that industry return skewness is related to some industry-level performance metric, which students should indeed care about in choosing majors
- To this end, we examine what happens to the average operating performance of firms in related industries
  - operating performance measured by return on assets (ROA), return on equity (ROE), net profit margin (NPM), sales growth (SG)

# Short-Run Industry Performance — Year *t*

| | Upon Graduation | | | |
|---|---|---|---|---|
| | RoE | RoA | NPM | Sales Growth |
| | (1) | (2) | (3) | (4) |
| Skew | 0.0003 | -0.0001 | 0.0002 | 0.0044 |
| | (0.0028) | (0.0011) | (0.0017) | (0.0046) |
| Mean Return | -0.0100*** | -0.0039** | -0.0017 | -0.0134 |
| | (0.0038) | (0.0016) | (0.0020) | (0.0087) |
| Return Coefficient of Variation | 0.0031** | 0.0010** | 0.0018*** | 0.0013 |
| | (0.0014) | (0.0004) | (0.0005) | (0.0022) |
| Log Number of Bachelors | -0.0162** | -0.0035 | -0.0038 | 0.0041 |
| | (0.0073) | (0.0030) | (0.0046) | (0.0184) |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | Yes | Yes | Yes |
| # Observations | 1598 | 1598 | 1598 | 1598 |
| Adj. R-Squared | 0.29 | 0.43 | 0.30 | 0.31 |

No relation between skewness and short-term operating performance

# Longer-term Industry Performance — Year $t$+5

| | 5 Years After Graduation | | | |
|---|---|---|---|---|
| | RoE | RoA | NPM | Sales Growth |
| | (1) | (2) | (3) | (4) |
| Skew | 0.0010 | 0.0010 | -0.0198 | 0.0020 |
| | (0.0028) | (0.0012) | (0.0355) | (0.0057) |
| Mean Return | -0.0011 | 0.0008 | 0.0730 | 0.0125* |
| | (0.0042) | (0.0018) | (0.0791) | (0.0066) |
| Return Coefficient of Variation | -0.0039* | -0.0007 | 0.0240 | -0.0086* |
| | (0.0023) | (0.0010) | (0.0253) | (0.0050) |
| Log Number of Bachelors | -0.0019 | -0.0014 | 0.2505 | -0.0510*** |
| | (0.0125) | (0.0057) | (0.2478) | (0.0149) |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | Yes | Yes | Yes |
| # Observations | 1269 | 1269 | 1269 | 1269 |
| Adj. R-Squared | 0.12 | 0.07 | 0.01 | 0.23 |

No relation between skewness and longer-term operating performance

# Structural Breaks

- Charles, Hurst, Notowidigdo (AER 2018) argue that
  - sharp increases in local housing prices in the 2000's are the result of speculative activity
  - unlikely to be caused by sharp changes in economic fundamentals
  - exploit structure breaks to test causal impact on college enrollment
- We use the stock market boom in late 1990's to identify similar breaks - "superstar industries"
  - both with extremely high volume, sharp increases in prices
  - importantly, many non-tech industries also went up substantially during the tech bubble (Campello and Graham, 2013)

# Structural Breaks

- Following CHN (2018), for each major $i$, we regress cumulative returns to its related industries on a time trend

$$R_{i,t} = \alpha_i + \tau_i t + \lambda_i (t - t_i^*) \times 1(t > t_i^*) + \varepsilon_{i,t}$$

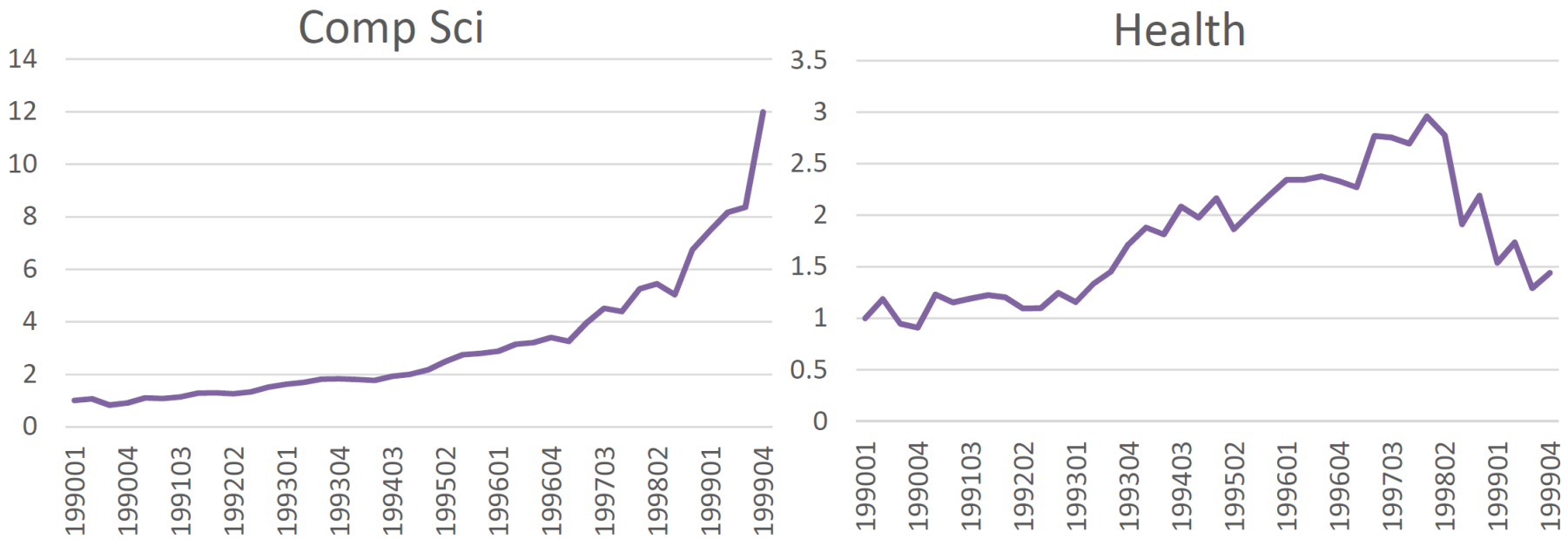
- Pick estimates with the highest $R^2$, to identify
  - timing ($t_i^*$) of the structural break
  - size ($\lambda_i$) of the break

- Then conduct the following "event-study":

$$log(bachelor_{i,t}) = \alpha + \beta Post_{i,t-3} \times \lambda_i + \gamma X_{i,t-3} + \mu_i + \tau_t + \varepsilon_{i,t}$$

- Also check measures of profitability (placebo tests)

# Computer Science vs. Health




Computer Science related industries exhibited a positive break in 97Q4; Health related industries exhibited a negative break

# Structural Breaks

| Major | Max Adj. $R^2$ | Structural Break: Time Trend | Lambda | t-stat | Break YearQtr |
|---|---|---|---|---|---|
| Aero & Astro Eng | 84.32% | 0.0181 | 0.0475 | 3.39 | 199404 |
| Chem Eng | 95.22% | 0.0301 | 0.0449 | 6.77 | 199402 |
| Civil Eng | 82.53% | 0.0197 | 0.0242 | 2.44 | 199501 |
| Comp Sci | 96.07% | 0.1032 | 0.7110 | 6.73 | 199704 |
| Earth & Ocean Sci | 11.93% | 0.0049 | -0.0283 | -2.35 | 199703 |
| Econ | 97.13% | 0.0615 | 0.1854 | 10.88 | 199502 |
| Elec Eng | 96.07% | 0.1032 | 0.7110 | 6.73 | 199704 |
| Health | 88.91% | 0.0628 | -0.2385 | -13.60 | 199704 |
| Ind & Manu Eng | 92.97% | 0.0336 | 0.0322 | 4.04 | 199404 |
| Mat Sci | 93.42% | 0.0324 | 0.0376 | 4.80 | 199404 |
| Mech Eng | 92.57% | 0.0330 | 0.0319 | 3.90 | 199404 |

| | Log Number of Bachelors | RoE | RoA | NPM | Sales Growth |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Post * Lambda | 0.4169*** | -0.0616 | 0.0132 | 0.0014 | 0.0748 |
| | (0.1336) | (0.7473) | (0.0161) | (0.0405) | (0.0580) |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Major Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| # Observations | 143 | 143 | 143 | 143 | 143 |
| Adj. R-Squared | 0.98 | 0.07 | 0.25 | 0.18 | 0.44 |

A one-stdev change in $\lambda$ is associated with a 12% increase in #graduates

# Additional Tests

# Direct Measures

- So far, we have shown that within-industry return skewness predicts college students' major choice
  - it's unlikely that high school or college students follow the stock market on a regular basis
- We think of cross-sectional return skewness as a capture-it-all measure for salient, extreme events in the industry
  - these salient, extreme events draw students' attention, and shape their expectations and human-capital investment decisions
- Look at three more direct measures
  - media coverage: cross-sectional skewness in media tone
  - initial public offerings: IPO first day returns
  - firm defaults (have a rating of 'D', 'SD'): number of defaults

# Skewness in News Tones

| | Log Number of Bachelors | Log Annual Wage | Net New Hires |
|---|---|---|---|
| | (1) | (2) | (3) |
| News Skew | 0.0683*** | -0.0149*** | -0.0215 |
| | (0.0189) | (0.0051) | (0.0457) |
| Mean Return | 0.0141 | -0.0010 | 0.0361 |
| | (0.0187) | (0.0025) | (0.0379) |
| Return Coefficient of Variation | -0.0036 | 0.0034** | -0.0072 |
| | (0.0119) | (0.0015) | (0.0186) |
| Log Number of Bachelors | | 0.0419** | -0.0049 |
| | | (0.0197) | (0.0172) |
| Year Fixed Effects | Yes | Yes | Yes |
| Major Fixed Effects | Yes | Yes | No |
| # Observations | 99 | 110 | 110 |
| Adj. R-Squared | 0.99 | 0.99 | 0.05 |

A one-stdev increase in news skewness is associated with a 6.8% increase in number of graduates, a 1.5% lower entry-level wage

# IPOs and Defaults

| | Log Number of Bachelors | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Mean IPO First Day Return | 0.0645*** | | | |
| | (0.0175) | | | |
| Log IPO First Day Dollar Return | | 0.1352*** | | |
| | | (0.0410) | | |
| Default Rate | | | -0.0522** | |
| | | | (0.0261) | |
| Default and Delisted Rate | | | | -0.0427* |
| | | | | (0.0240) |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| Major Fixed Effects | Yes | Yes | Yes | Yes |
| # Observations | 299 | 299 | 264 | 264 |
| Adj. R-Squared | 0.98 | 0.98 | 0.98 | 0.98 |

A one-stdev change in first day IPO returns, default rate is associated with a 6.5%, -5.2% change in #graduates

# Male vs. Female

- Recent research (e.g. Zafar, 2013) suggests that males and females differ in their beliefs and preferences
  - males are more likely to be drawn to salient events and extreme payoffs — possibly due to sensation-seeking or overconfidence
- Under this view
  - we should observe a stronger response of male students to salient, extreme events than female students when choosing major
- We repeat our analysis with male graduates vs. female graduates

# Male vs. Female

| | Log Number of Bachelors |
|---|---|
| | (1) |
| Skew | 0.1043*** |
| | (0.0204) |
| Skew * Female | -0.0770*** |
| | (0.0285) |
| Mean Return | 0.0946** |
| | (0.0410) |
| Mean Return * Female | -0.0705 |
| | (0.0617) |
| Return Coefficient of Variation | -0.0073 |
| | (0.0158) |
| Return Coefficient of Variation * Female | 0.0439* |
| | (0.0228) |
| Female | -2.2289*** |
| | (0.0932) |
| Year * Gender Fixed Effects | Yes |
| Major * Gender Fixed Effects | Yes |
| # Observations | 1042 |
| Adj. R-Squared | 0.95 |

# Number of Master Students

| Weighting of RHS Variables | Log Number of Masters | | | |
|---|---|---|---|---|
| | Size | Employment | Employment | Employment |
| | (1) | (2) | (3) | (4) |
| Skew | 0.1178*** | 0.0843*** | | |
| | (0.0234) | (0.0216) | | |
| Skew_Monthly | | | 0.1053*** | |
| | | | (0.0321) | |
| Skew_Quarterly | | | | 0.1036*** |
| | | | | (0.0328) |
| Mean Return | 0.0120 | 0.0682* | 0.0509 | 0.0670** |
| | (0.0270) | (0.0351) | (0.0326) | (0.0326) |
| Return Coefficient of Variation | -0.0121 | -0.0112 | -0.0162 | -0.0077 |
| | (0.0153) | (0.0136) | (0.0111) | (0.0112) |
| Year Fixed Effects | Yes | Yes | Yes | Yes |
| Major Fixed Effects | Yes | Yes | Yes | Yes |
| # Observations | 521 | 521 | 521 | 521 |
| Adj. R-Squared | 0.91 | 0.91 | 0.91 | 0.91 |

A one-stdev increase in skewness forecasts a 10% increase in #Masters

# Work in Progress

- Evidence from SurveyMonkey
  - beliefs: how people's (ex-ante) expectations of job prospects compare with the (ex-post) average job outcome of their cohort
  - preferences: are people with lottery preferences more likely to be drawn to superstar industries
- Granular data of individual CVs from online sources
  - can observe individuals' major choice and career outcomes
  - can examine variation across geographical locations, universities (e.g., elite vs. non-elite)
  - can identify individuals that start own businesses

# Conclusions

- We study the impact of salient, extreme events on an important human capital decision — college major choice
- Positive salient events predict a larger number of college graduates in related major fields (vice versa for negative extreme events)
- Upon entering the job market, lower wages for entry-level positions
- These adverse effects on career outcomes can last for years/decades

# Conclusions

- Our results contribute to the vast literature on individuals' education choice and career outcomes
  - we examine the role of attention-grabbing events in determining college students' major choice
- Our paper also provides evidence for a growing theoretical literature on the impact of salience on human decision making
  - we are the first to examine the impact of salience on human capital investment decisions
- Our paper complements the literature on skewness and investment
  - one potential concern with this literature is that skewness can be easily diversified away in a portfolio
  - diversification does not apply to human capital investment